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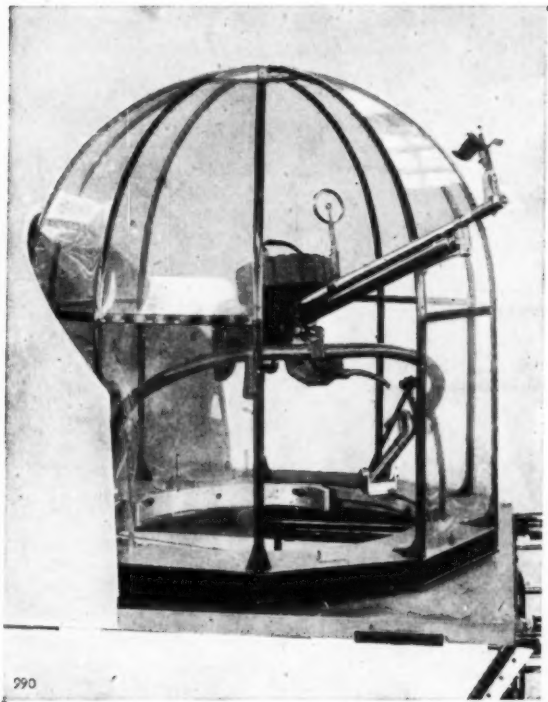

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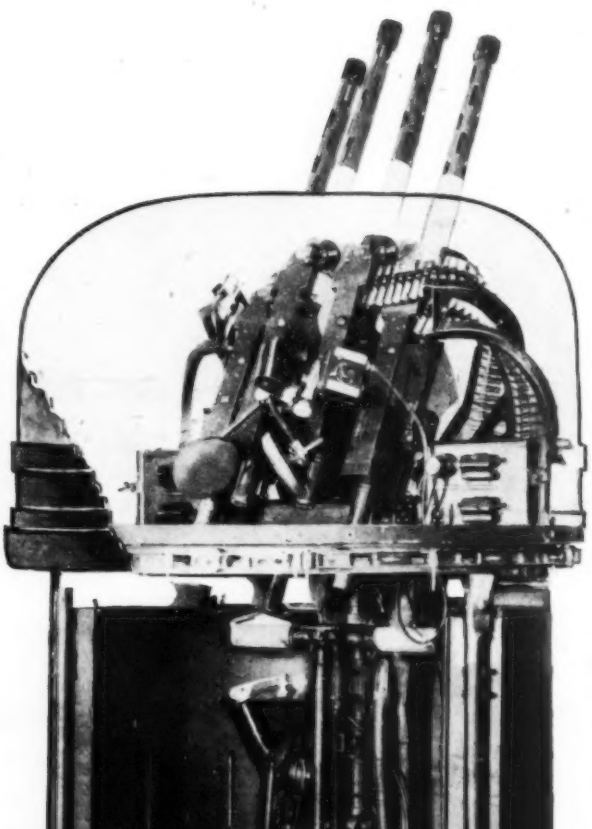
1930 — 1940



1930 – 1940

1930 saw the first "Bristol" attempt to shield both gun and gunner from the slip stream. This design was mechanically operated, and counter-balancing enabled the gun to be trained against the comparatively small loads at the speeds of that day.

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FLIGHT
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The AIRCRAFT ENGINEER

FIRST AERONAUTICAL WEEKLY IN THE WORLD : FOUNDED 1909

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The Outlook

Getting on With the "Civils"

BRIEF reference was made in last week's issue to the significance of the unofficial data quoted for the large commercial aircraft being designed by the Bristol firm as part of the post-war, long-term policy, and it was pointed out what the figures would mean in the way of power plants. It has been stated officially that other firms have been entrusted with the task of designing different types.

Much has been made of the fact that the work of planning and designing these post-war types must not be allowed to interfere with the war effort, and we have heard a good deal of designers doing all this planning "in their spare time." In view of the thousands of drawings needed before quite small parts of an aircraft structure can be made (even "by hand"), the idea of tackling the design of post-war aircraft as a spare-time job is really rather ridiculous. The way to set about the task is, of course, to set aside a certain number of technicians and a certain number of draughtsmen and assume that they can be spared without seriously affecting the war effort. That should be possible, since production is, one assumes, running smoothly by now. There are, however, many other aspects of the subject to which little attention has been given, so far as public utterances by people in authority are concerned. For example, the Government has not yet announced which body or department is to be entrusted with the airworthiness of these new commercial types. Airworthiness is a wide term and covers such subjects as stressing, load factors, inspection.

Before the war the Air Registration Board looked after the airworthiness requirements of aircraft up to 10,000 lb. weight. The Board is still responsible for the civil aircraft types registered and operating in and from this country. It would be logical to let the A.R.B. continue in charge of the new types, but the Board has probably lost considerable numbers of its staff, some or all of whom are presumably now working in the Air Ministry or Ministry of Aircraft Production.

Knowing the ways of Government departments, we can imagine the indignation that would be expressed if it were to be suggested that such men should be returned to the A.R.B. The point is that such protestations should be overruled. The removal of a few dozen men essential to the carrying out of civil airworthiness work cannot possibly do serious harm to the war effort.

Then there is the question of inspection. The firms entrusted with the work of designing the new types may be assumed to have the confidence of the Government. Presumably that confidence extends to the firm's approved inspectors. The A.I.D. must have its hands full with inspection of service aircraft (the question of engine inspection need not be looked upon as urgent at this stage), and it would be logical to argue that to load the A.I.D. up with the extra work of inspecting the new civil type *would* be to interfere with the war effort.

In several recent debates in Parliament the view has been expressed that after the war civil aviation should be removed from the control of the Air Ministry. The Government has not given a definite answer to that, but the feeling is general that it agrees, although it may be unwilling at present to give a definite undertaking to that effect. The tendency is, however, in that direction, and a small start might well be made now by handing the entire official machinery of airworthiness over to the Air Registration Board which, in the past, has proved itself capable of dealing with it efficiently. Success of future British civil aviation will depend very largely on the degree to which we can reduce Government "grandmothering."

Sicily Invaded

TO many observers, including some who may have been wise after the event, it always seemed clear that Sicily must be the first objective of General Eisenhower's advance from the Africa springboard. To others it did not seem so certain, and perhaps the Axis leaders were among those who were in doubt. Every effort was made by the United Nations to create uncertainty in their minds by spreading the preliminary bombardments and reconnaissances as widely as possible. The Axis has been nervous about the Balkans, and the recent Commando raid on Crete was calculated to increase that apprehension. Sardinia was bombed quite as heavily as Sicily was. With a commanding air arm it is possible to spread one's operations over such a wide area that the enemy can never be sure where the real blow will fall.

The landings on the beaches of Sicily have been yet another example of combined operations between the three Services, as well as between the British and Americans, who are simply one force in the Mediterranean. It is the most perfect example of such combination yet carried out, and Navy, Army and Air Force each played its part to perfection. If one had failed the whole operation would have suffered. The air arm was used with the utmost skill in giving fighter cover to the transit across the water and during the landings, in depositing airborne troops by glider and parachute ahead of the landing parties, and in a final crescendo of bombing just before the ships arrived as well as during the actual landings. The obliteration of the Axis headquarters and the adjacent telegraph office was a masterpiece. This must have left each local commander on the island in the most desperate state of uncertainty about what was happening.

The Army must strike the decisive blow, but it owes its chance to the Navy and Air Force.

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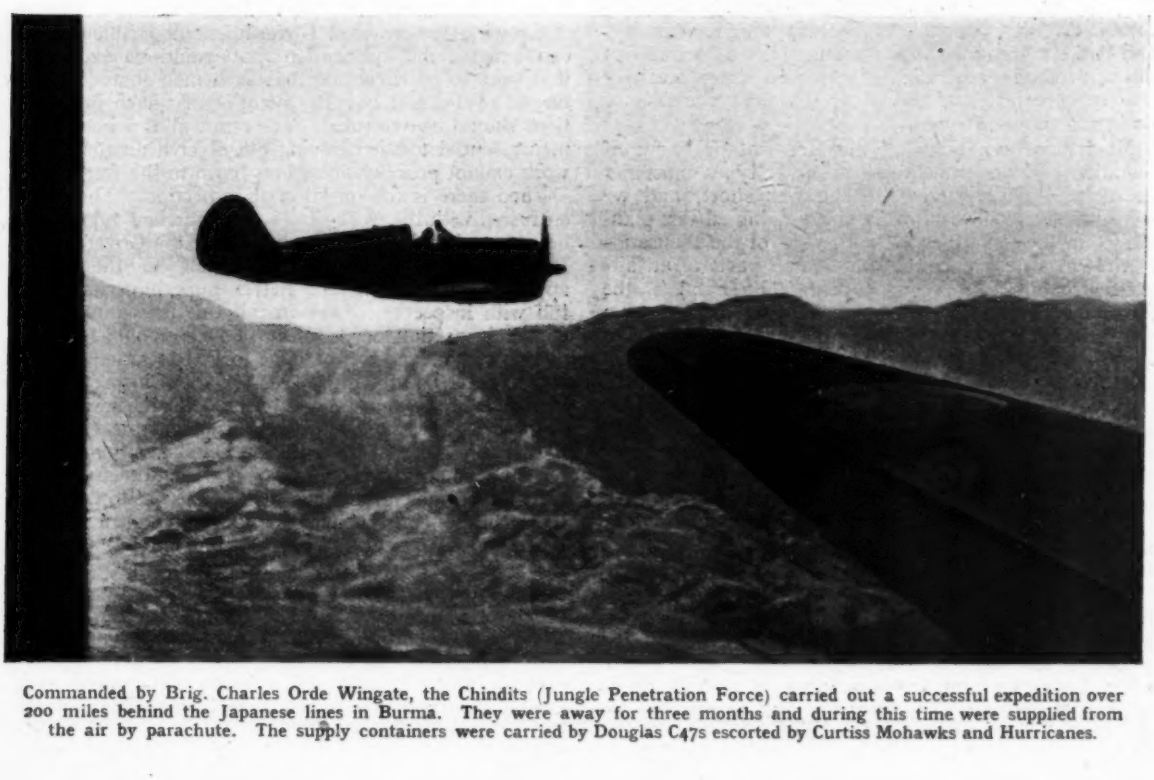
W.A.A.F. Enterprise

ON all sides the value of the work done by the Women's Auxiliary Air Force for the R.A.F. is generally and warmly recognised. It is most gratifying to know that, in return, the R.A.F. is doing something definite and valuable for the advantage of the airwomen.

The scheme known as Progressive Training aims at making each member of the W.A.A.F. a better airwoman, but also looks forward to the time when the war will be over and aims at making her a better and more useful woman.

The W.A.A.F is not a school, but it has collected a huge number of young women from every walk of life and has placed them in one great organisation. Surely, it was felt, from such an association benefits common to all ought to be derived. The scheme of Progressive Training endeavours to draw out and develop all qualities, and to make each member benefit by her companionship with the rest. How the scheme works is described on another page of this issue.



Commanded by Brig. Charles Orde Wingate, the Chindits (Jungle Penetration Force) carried out a successful expedition over 200 miles behind the Japanese lines in Burma. They were away for three months and during this time were supplied from the air by parachute. The supply containers were carried by Douglas C47s escorted by Curtiss Mohawks and Hurricanes.

LETHAL ELEGANCE: A De Havilland Mosquito fighter shows off its shapeliness above the cloud layer.

WAR in the AIR

The Strain on the Luftwaffe : Aircraft in the Kursk Battle : The American Pacific Offensive

SIGNS of the overstrain to which the *Luftwaffe* is now subjected are shown by conflicting reports of its movements and reinforcements. Field Marshal von Richthoven has lately been moved from the Russian front to some post connected with the Mediterranean, though how he fits in with Field Marshal Kesselring has not been made clear. It is presumed that though he left *Luftflotte* No. 4 in southern Russia he did bring with him a small air contingent, perhaps between 100 and 200 aircraft, and these may have accounted for the increased fighter defence which Allied bombers have met over the Italian islands of late.

On the other hand, the Russians have reported that in the German attack on the Kursk salient between Orel and Bielgorod the Germans have thrown in more aircraft, including a high proportion of fighters. It is the fighter section of the *Luftwaffe* which is most severely stretched. Certainly no fighters are likely to have been withdrawn from northern France and western Germany, where they are expected to meet the British and American bombing attacks, and perhaps to cover the reserve bomber force which is held there to counter an Allied invasion.

It follows that the only way in which the Germans could increase their fighter strength on the front of their assault would be by moving squadrons up from other sectors of the Russian front, where things have been comparatively quiet. It is something to know that the Germans now are not strong enough to attack again all along the Russian front. The Russian pilots, now in the majority over their opponents, have been fighting with great dash and courage. Their recent work in bombing communications behind the German lines may well have had its effect in preventing the enemy's attack, when it came, from being made in overwhelming strength. We must remember, however, that the Germans are clever and indefatigable in making repairs, and that railways are more quickly repaired than factories can be. If any real good is to be done, a line must be dislocated at some point like a cutting, and the breach must be kept unrepaired, even at some sacrifice of bombers and their crews.

GUERILLAS' GRUB: Dropping supplies for Brigadier Wingate's force operating behind the Japanese lines in Burma. Landings were also made by aircraft in jungle clearings to take off the sick and wounded.

The Atlantic Battle has done nothing to raise the low spirits of the Germans, and the appearance of the convoy carriers has been an unpleasant pill for them to swallow. In a recent broadcast Admiral Lützow, the naval commentator, gave a very full description of the difficulties which now confront the U-boat commanders, including these escort carriers. It was all in a very minor key, and included the admission: "In short, the enemy at present has the upper hand."

Another pleasing, and rather mystifying, item of news comes from the Aleutian islands, where a United States surface force the other day bombarded Kiska Island. The shore batteries did not return the fire. One wonders why. Perhaps recent raids by American bombers have had an

WAR IN THE AIR

unexpectedly good effect on the battery positions on the island, though it is not easy to believe in such an unusual result.

Far away to the south, a Hudson of the Royal New Zealand Air Force from Guadalcanal has sunk a Japanese submarine. New Zealanders have been prominent in every major activity of the Empire Air Forces ever since Cobber Kain of No. 73 Squadron (Hurricanes) made a great reputation in the almost forgotten days of the A.A.S.F. in France, and there have been squadrons mainly composed of New Zealanders in the R.A.F. This, if we remember right, is one of the first outstanding successes credited to the R.N.Z.A.F. as a Force, and gained comparatively near to its home waters —at least in the Pacific Ocean.

The Battle of the Ruhr

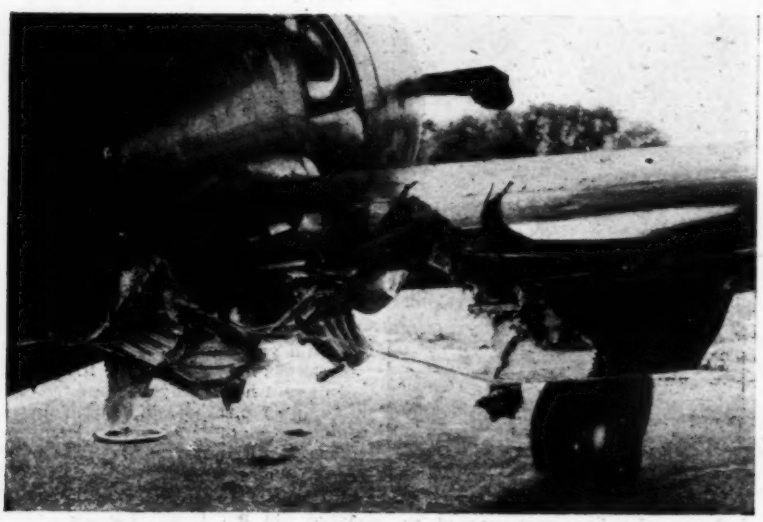
MR. DINGLE FOOT, Parliamentary Secretary to the Ministry of Economic Warfare, has made a remarkable speech, in which he declared that the Germans knew that they had lost the Battle of the Ruhr. They showed it, he said, by the way in which they were moving all possible equipment from that area. The Ministry of Economic Warfare is in the best position to know the facts, and Mr. Foot's testimony is a great feather in the cap of Bomber Command. Of course, the coalfields of the Ruhr cannot be moved, and that must set a very awkward problem for the Germans. There are other coalfields in German possession, notably in Silesia, and no doubt great manufacturing activity has been developed there. It is known that the Germans had amassed a vast strategic reserve of weapons before entering on the war, and the time has not yet come when German troops have to fight without a sufficient supply of some vital weapon, though already the shortage of fighter aircraft is causing them some embarrassment. If the war lasts long enough the British and American bombing offensive must result in German shortages in other weapons, but it may well come about that before that time arrives the German armies will have been beaten on land by the Russians in the East and the British and Americans in the West. At least, we must all hope so.

The Air Offensive

THE bombing offensive continues, and whenever circumstances are favourable the R.A.F. flies out at night and the American Eighth Air Force by day, to strike ever harder blows. By ringing the changes on objectives, the defence of the enemy is scattered and puzzled, for nobody can tell where the next blow will fall. By day, too, the Allied fighters and fighter-bombers continue their sallies against targets within their reach, and seriously disturb the transport system of the enemy. The losses of these light day raiders are very small, while the heavy bomber force has now reached a pitch of strength that enables it to bear losses which a year ago would have seemed crippling. The public is still inclined to feel aghast when it reads that 30 bombers failed to return from a raid one night, and certainly such a loss must cause much grief in many homes. But despite the losses our bomber strength continues to grow, and the numbers of the striking forces which now set out on a raid are such that every crew has a better chance of coming safely home than was the case in the smaller raids of a year ago.

In the same way all the Allied Air Forces in the Mediterranean have continued their ceaseless battering of Italy, Sicily and Sardinia by day and night. Every now and then a new enemy airfield has been mentioned as having been raided, and at the present rate it seems that when the Allied armies advance across the sea (which may have happened before these words are published) they are not likely to meet with much opposition from the air. Recently a convoy of supplies has made its way safely through the Mediterranean to Haifa, an event which had not taken place since Italy entered the war. The reserve force of bombers mentioned above might move down to oppose an invasion from Africa, but that force has also to consider the probability of a simultaneous attack from Britain on some point on the long coastline of northern occupied Europe. The Axis is confronted with the chance, or more than the chance, of having to fight in not two but three directions at the same time. Interior lines give some advantage, but when the air strength of the invaders is greatly superior, as the Allied strength now is, interior lines create problems of their own. Exterior lines give to the superior naval Power the choice of points of attack, and if two points in the West are attacked at the same time as the Russians in the East can threaten an advance, the Germans will be in a sorry plight.

Both Axis Powers have been showing great nervousness as regards the Balkans, and the recent British Commando raid on Cretan airfields is cal-



DONNER UND BLITZEN: What happened to the wing of a Thunderbolt which was hit by five 20mm. shells during a sweep over northern France.

JACOB'S LADDER: A perfect "echelon stepped up" of Grumman Avengers flying over the south-west Pacific.

ENEMY AIR LOSSES TO JULY 10th

	Over G.B.	Continent	Middle East	N.W. Africa
July 4	0	4	7	44
" 5	0	0	8	37
" 6	0	8	1	2
" 7	1	0	0	12
" 8	0	4	11	10
" 9	2	2	0	15
" 10	0	1	0	22
	3	19	27	142

Totals: West, 7,088; Middle East, over 5,443; North West Africa, 2,352.

calated to have further upset their nerves.

Off the Springboard

THE invasion of Sicily was marked by the first use of glider-borne troops by British forces. Parachute troops were also dropped, but they have been used before, though probably not with the same effect. The gliders and their tugs flew off first, and the parachute men dropped afterwards. Both landings were made by night, for it has been realised that as surprise is one of the main assets of airborne soldiers, it is always best for them to land at night if that is in any way possible. It does not appear from the first accounts that General Eisenhower sent over any men in power-driven troop-carriers, for in their case landings in strange country would be more hazardous, and even successful ones might still mean losing the valuable aircraft. They would, in fact, need regular airfields, and they could not use those still in possession of the enemy. Very many of the Sicilian airfields have been so ploughed up by Allied bombs that they will not be usable by night until the craters have been filled in. So the tugs cast off their gliders and flew back to their African bases in formation, and showed their contempt for the enemy by keeping their navigation and landing lights full on as they arrived. A full description of the Horsa glider appears in this issue.

The R.A.F. and the U.S. Army Air Force played a very full share in the landing, and the new fighter-bomber A 36, which is a development of the Mustang, was very useful in strafing the enemy on the ground after the Allied troops had landed. During the landing the Allies held a decisive superiority in the air. After the first Army troops had established themselves on the island they rather expected to be bombed by the enemy, but few if any of them had that experience. The swarms of Allied aircraft overhead met with hardly any opposition, and were surprised at the weakness of the A.A. fire from the ground. The preliminary artillery duel of the air had been completely won by the Allies, and both Navy and Army benefited by that conclusive victory.

WAR IN THE AIR

BRITISH & U.S. AIR LOSSES to JULY 10th

	Over G.B. A'crft.	Continent B'bns.	Continent F'trs.	Middle East A'crft.	N.W. Africa A'crft.
July					
4	0	1	4	3	13
5	0	0	0	0	12
6	1	1	1	1	5
7	0	0	2	0	5
8	0	8	2	2	9
9	0	10	1	0	10
10	0	4	0	1	28
	1	24	10	7	82

Totals: West, 6,730; Middle East, about 2,109; North West Africa, 859.

W.A.A.F. Progressive Training

By MAJOR F. A. de V. ROBERTSON, V.D.

A GROUP of airwomen sitting on the grass in the charming garden of a rest house, and discussing with a Flight Officer the sort of house each would like to have after the war, makes a delightful picture and gives a good idea of how the scheme of progressive training is worked in the Women's Auxiliary Air Force. The discussion was very informal and frank, and the Flight Officer, who was evidently on the best of terms with her airwomen, was very skilful and tactful in the way she kept it on practical lines. One wanted a flat, another a two-storied house with a small garden, and so on, and each was urged to give reasons for her preference, taking into account the possibility of a husband and children.

In the charming garden of a rest house a Flight Officer leads a discussion on ideal homes.

The progressive training scheme, which aims at making each airwoman a more useful member of the Service during the war, and a better member of society in the coming days of peace, is divided into six sections. These are denominated: (1) Subjects of immediate practical use—e.g., care of clothing and quarters; (2) subjects useful as (*a*) a tradeswoman and (*b*) a citizen, e.g., mathematics, science, office procedure, etc.; (3) subjects of general Service knowledge—e.g., the work of trades, branches and Commands, and of all H.M. Services; (4) means of developing character and power of leadership—e.g., instruction in speaking and giving orders; (5) drill, which smartens personnel and causes instant reaction and obedience to orders; (6) physical training, whose benefits are obvious, especially for those engaged in sedentary work.

All this scheme is carried out voluntarily, under the supervision of W.A.A.F. officers, and is additional to such trade training, drill, and physical training, etc., as all airwomen have to undergo.

Recently I was privileged to visit an R.A.F. station where hundreds of women are employed, and was shown various sections of the scheme in operation. As an old infantry officer I was much impressed by the smartness of the squad drilling on the parade ground under an instructor from the Royal Air Force Regiment. It was really good. When the squad had gone through the regular evolutions women N.C.O.s were told to give the orders, and if their voices did not quite rival the bull-of-Bashan roar of the typical old drill sergeant (who, we have been assured, expired with the Armistice of 1918), the orders were clearly and incisively given. Future leaders were obviously in the making.

The physical training was carried out under a qualified sergeant airwoman, and after a while she called out several airwomen in turn and put them in charge. The class wore dark blue shorts and green jerseys. There was no lack of readiness to take command, and none of the bashfulness so often displayed by young subalterns.

The field kitchens were much more interesting. They were in charge of an R.A.F. catering officer from South Africa, who told me that his father had fought in the South African War against the British. So did Field Marshal Smuts. Of course, there are many airwomen who are cooks by trade, but every airwoman on the station, whatever her trade, has to do a course of seven days working with the cooks both indoors and at the field kitchens.

Of course, a mixed choir was to be expected on such a station, and sure enough I was treated to a slight taste of its quality. The members are about half women and half men.

Probably the best work of the scheme is done through the medium of lectures and discussions. In the opening paragraph of this article a slight description of a discussion is given. A list of the discussions already held is most impressive, though much too long for reproduction here. Obviously, service in the W.A.A.F. now implies a very liberal education, and it cannot but have an admirable effect on the nation's life after the war.

HERE AND THERE

New Two-way Airgraph

A NEW two-way Airgraph service has just been started. It is to operate between Australia and Britain, Canada and Africa.

Allies' Aircraft Production

THE United Nations' production of aircraft is probably three times as great as that of the combined output of Germany, Japan and Italy, estimate officials of the United States Government.

R.A.A.F. Commissions

ROYAL Australian Air Force pilots and observers overseas on coming up to normal standards may now be commissioned, according to Mr. Drakeford, the Australian Air Minister.

Previously limits were placed on the commissioning of air gunners and wireless operators, but these are partly lifted and commissions may be granted to suitable types.

More Canadian Aircrews

MORE Canadian Air Force personnel have recently arrived in Great Britain. Among the party are pilots, gunners and wireless operators, as well as some Canadian W.A.A.F.s.

Daughters of Diana

TWO Russian women pilots in the Red Air Force have recently been mentioned in Tass Agency news items. They are Jr. Lt. Anna Yegorova and Sen. Sgt. Maria Ivanovo, both girls in their early twenties and with 243 and 125 operational flights to their respective credits.

Anna is the pilot of an "attack aircraft" in a Guards squadron and holds the Order of the Red Banner for her sorties in a Stormovik against German positions. A qualified pilot before the war, she volunteered for active service on the day the Germans invaded her country and has now been posted to a training course for deputy squadron commanders.

Maria Ivanovo is a bomber pilot and has just been awarded the Order of the Patriotic War, 1st Grade. She has been on "ops." for 70 days and her 125 sorties against enemy targets include 30 night raids.

U.S. Parachute Jump

IT is reported that a parachute jump of 7½ miles has been made in the United States in order to test oxygen equipment.

The jump was made by Lt. Col. William Lovelace, who supervised the development of the equipment, and it was the first parachute jump he had ever made.

Repeat Performance

SUCH was the interest shown in the recent discussion on the education and training of aeronautical engineers, held by the Royal Aeronautical Society, that it has been decided to hold a similar meeting on July 23rd.

As before, it will be held in the lecture hall of the Institute of Mechanical Engineers, Storey's Gate, Westminster, S.W.1, at 5.30 p.m., and the R.Ae.S. will welcome anyone with views to express on the subject, whether members or not.

Written views from anyone unable to attend in person will also be welcomed.

Indian Airmen Here

A GROUP of Indian airmen, having qualified as pilots, combat officers and technicians under the Empire training scheme, have now arrived in this country to take additional specialist courses, including active operational training for the fighter pilots among them.

The visit has been organised by Field-Marshal Sir Archibald Wavell, who wished the men success in this country and a safe return to India in due course to further the advancement of the Air Force there.

New Russian Dive Bomber

A MOSCOW broadcast recently mentioned for the first time a new Soviet dive-bomber, the Petrikov II (P.R.2), which is reported to be doing useful work at the present time.

No technical details of this aircraft have yet been released by the Russians.

Post-war Airport Plans

A LONDON airport, to be used as a base for both land aircraft and seaplanes and costing £20,000,000 is visualised by Mr. F. G. Miles, the aircraft designer.

Such an airport would have runways of 2½ miles long by 600ft. wide, and would be capable of dealing with 8,000,000 passengers a year on an allowance of 150 per aircraft.

Blue Prints by Airgraph

DUNLOPS are now sending blue prints to their factories in India, South Africa and Canada by airgraph, which not only saves time and reduces risk of loss, but minimises the chances of leakage of information to the enemy.

The drawings can be made on the airgraph form itself, or, alternatively, a photographic copy of the same size may be used.

Swedish Aviation Exhibition

AN interesting exposé of Swedish aviation in wartime was given at an exhibition recently opened in Stockholm under the auspices of the Swedish Air Force and various Swedish aviation companies and organisations.

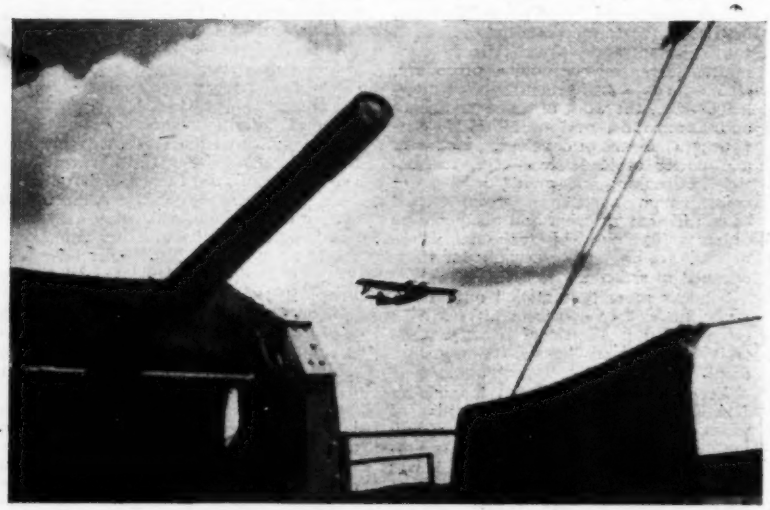
By means of exhibits of aircraft, details of various kinds, pictures, and maps it told the story of the development of the Swedish Air Force from its foundation as a separate but small force in 1925 to an arm of considerable strength.

Much space had also been devoted to the ground organisation, and the section for civilian air traffic displayed the development of the Swedish air lines during the past 15 years.

What a Blow!

WHEN the A.T.C. London Command Athletic Championships are held at the White City Stadium, Shepherds Bush, on Saturday afternoon, one of the features will be the appearance of massed bands of 650 cadets, composed of trumpets, bugles and drums, under the direction of Flt. Lt. L. E. M. Price, London Command A.T.C. Director of Music, and led by Drum Major Wallace, of the Ilford Wing.

The R.A.F. Central Bands will also be in attendance, and a march past salute will be taken by Air Chief Marshal Sir William Mitchell.



IN THE WESTERN APPROACHES: A Catalina flying boat of Coastal Command glimpsed from beneath the businesslike 3in. gun of a British mine-layer off the Western shores of Britain. The "Cat's" latest accomplishment is reported to be that of torpedo carrier, a fact advertised in at least one American aeronautical journal recently.

Topics of the Day

The Psychology of Slang

Good and Bad Nicknames in the Service : The Propaganda Effect of Ingeniously Humorous Expressions : Keeping Our Sense of Proportion

IN the midst of a lot of quite dignified slang and really excellent phrases, some of which will long outlive this war, the Air Force has coined some really atrocious words and gone in for some awful mannerisms. Not the least abominable of these mannerisms—if such it can be called—is that of shortening, in a friendly way, nearly all the excellent names which have been applied to the various aircraft types in service. And I mean mechanical types, of course, not merely the various human types who make up the Service as such.

A year or two ago most of the pet names had some humorous and complicated basis of interest to the more serious-minded student of word-formation and development. What could be more interesting, for instance, than the word "Wimpy"—or, perhaps, "Whimpey"? Though painful, no doubt, to the earnest people who, sitting round a board-room table, produced with much labour the name Wellington, the word, nevertheless, has a special interest of its own. Who, outside the Service, would have imagined that the nickname could have been developed from a strange little character, J. Wellington Whimpey (or Wimpy), of strip fame? That pet name has a touch of genius about it.

Even "Hurribird" was not too bad, "Spit" has a certain violence which can tell its story, while "Maggie" and "Lizzie" have a safe and friendly sound. The earlier abbreviations were not so much abbreviations as extensions of an explanatory nature, and nobody could possibly mind them. In fact, at the back of my mind, if only I could remember them, there are a whole lot of really ingenious names for the different types which were in circulation at or near the beginning of the war. Maybe people had more time and more ingenuity in those days.

But the present-day habit of merely shortening, and of adding a diminutive or loving suffix to the result, takes a lot of bearing with—even if people are in such a hurry that they cannot find the time or the energy to produce the whole, and generally excellent, word. Nothing could be much more expressive of the nature and use of the beast than the name Mosquito, a quick-moving and hard-biting insect. What have the ruffians reduced it to? "Mossie" . . . "Mossie" . . . For heaven's sake! It immediately becomes a soft and friendly, almost inanimate beast. Friendly it is, except to our enemies, but it is certainly not inanimate and not even particularly comfortable to sit in for long periods.

"Lanks" and "Beaus"

The Lancaster has become a merely feeble "Lank," the Beaufighter has become the "Beau," or even, heaven help us all, the "Bowey," and the Defiant a "Diffy." One can, in all kindness, find excuses or even produce reasons why the shortened versions are good in themselves. The Lancaster is, after all, a lanky device and covers great distances in big and, perhaps, ungainly strides; the word "Beau" has something of a bite and quickness of its own; and the Defiant has now become a friendly affair used for simple little non-operational jobs. But "Bowey" . . . No! Some, even, are, quite accidentally, not too bad. The "Lib" doesn't make a bad Liberator—and the word Liberator is, perhaps, just a shade too self-consciously priggish for a destroyer; the "Fort" is a vigorous and stable Fortress; the "Cat" is a meaningful and more agile Catalina.

Thank goodness—at least, to my knowledge—the Mitchell is not called the "Mitch," the Sunderland the "Sundae," the Typhoon the "Tiffie," the Halifax the "Hallie," the Oxford the "Oxy" and the Thunderbolt the "Thundy." By all means call the last a "'Bolt" or a "Thunderbird" if you like—or even a "Blitzenbird." Such appellations are in keeping with the true spirit of nicknames, which should be more telling than the original and have a certain degree of humorous suggestion. For instance—to produce some very bad suggestions—one can decently call a Sunderland a "Sundersea" or "Tyneboat," a Halifax a "Woolifax," and the Oxford a "Nuffield Trainer"—shortening each accordingly until nobody who isn't in the swim can possibly see how the silly little word has been reached. Even the word "Whimpey" used to keep a lot of people guessing.

Such nicknames, and the accompanying Service expressions, have, I think, a far more considerable propaganda effect than is generally realised. The Germans are and always have been rattled—one can use no other word—by the carefree English manner. While they are trying so hard and taking things so very seriously it gives them a curious sense of inferiority when their enemies—who *must* be taken seriously—refuse to begin to take the war or their fighting machines as anything much more than a joke in rather bad taste.

Serio-Comic Insults

Those who have read "The Last Enemy" will remember how the scratch boat-race team irritated everyone so profoundly when they refused to take the thing seriously. It was almost an insult to be so happy-go-lucky when the German team was working itself into a froth over its training schedule. It was even more disturbing when the scratch team miraculously won—just as it must be disturbing to be bombed by a "Whimpey" (perhaps labelled *Pansy*) or shot down by a "Mossie." I was fiddling about on some skis in Austria in the winter before the war and the same feeling of irritation was produced by the behaviour of the two or three British entrants in the Slalom. Apart from one woman—who should have won the female section but fell on the last turn—these entrants started for the fun of the thing and fell consistently the whole way down. It wasn't that they weren't good, but merely that they couldn't possibly put in the necessary practice to beat the pros., yet saw no reason why they shouldn't have their fun. It was significant that the only German entrants were people who stood a very reasonable chance of winning.

I sometimes feel like writing a large *opus* on the importance of this national characteristic of treating everything but the essential matters of living, loving and dying, as a sort of joke (and, I repeat, in rather bad taste). Because it is the only characteristic which we can use to beat the Axis and keep level with the rest of the world in the peace which will eventually follow the war. It is not really important that we (or anybody else) should produce the best or the cheapest of any commodity, but it *is* important that we should be liked and respected, that we should continue to enjoy our world for what it is and with no absurd illusions about *Herrenvolk* or what-not, and that we should not lose our sense of proportion and become a nation of go-getters, face-grinders and hard-working little prigs. Let us work hard at things we like to do—for the fun of working and for no other reason; let us regain our old reputation for fairness and generosity and good nature; and let us make our own country and Empire the kind of places where other people would be

THE PSYCHOLOGY OF SLANG

only too pleased to live. In that way we and the English-speaking peoples can alter the world.

All of which sounds pretty bad when it is produced in black and white, but I imagine people will know what I mean. For instance, people—particularly those in the Services and of no high rank—are inclined to take slight umbrage because so many other people are earning a very great deal and having (apparently) a whale of a time while they, the umbrage-takers, mess around in a uniform. I can assure these umbrage-takers that the wartime go-getters are far from happy (even the pot-bellied black marketeers); that they have to work very hard; and that most of them would far rather be in one or the other of the Services.

Let us not, even in a quiet and good-mannered way, repeat the German mistake of taking action against those who appear to be cutting the ground from under our feet, and making a handsome profit while so doing. The Germans were angered by the Jews largely because they appeared to be so successful while thousands of good Germans (relatively speaking!) were on their uppers. Some of us are inclined to be angry when we read so often of black marketeering and other crimes carried out by people with rather significant names; we can see no reason why we should fight and even die so that a few unhealthy parasites should prey on us—these same parasites forgetting, as always, that only the fighters stand between them and some most uncomfortable concentration camps.

The go-getters are a very useful leaven in the public bread. Or even a very useful virus, inspiring us to better things. In any case who, in possession of his brains, faculties and health, wants to spend his life buying cheap and selling dear, worrying like mad about the price of this and that, and sitting for hours in uncomfortable and unhealthy offices. Let them get on with it. None of them are as happy and healthy as a single Commando, Paratroop, fighter pilot, or even plain Erk with a spanner in his hand.

All we can do is to laugh at them, and if, at the end of all this, they make a world which is not fit for healthy, normal people to live in, we can then take jesting, good-humoured action. If we, the happy exploited ones, walk casually out on them, they can't do much about it except to reorganise the world so that we are prepared to walk back again. They're only little round men who get out of breath very easily and are awfully self-conscious of their real failure to justify themselves as human beings. A good loud laugh will send them all fluttering down the street like so much waste paper.

INDICATOR.

Samaritan Spitfires

New Phase in Air/Sea Rescue : Special Rubber Dinghy for the Single-seater Fighter to Drop

A NEW type of rubber dinghy specially designed for dropping from Spitfires is the latest phase in the work of the R.A.F. Air/Sea Rescue Service. This dinghy is packed in cylindrical form and is accompanied by a food and first-aid container of the same shape and dimensions, to which it is attached by a short length of stout cord.

Both "cylinders" are launched simultaneously, of course, but each occupies its own chute in the fuselage of the Spitfire just aft of the trailing-edge. These two chutes are a few inches apart and inclined towards the rear, their exits being closed by small flaps after the two life-saving cylinders have been inserted against the pressure of ejector springs. Thus, when the pilot operates the release, they are forcibly launched downwards and rearwards, this method having been found greatly to improve the accuracy of aim which can be achieved; just how accurate this can be in the hands of a really skilled Air/Sea Rescue pilot was very convincingly demonstrated last week-end when *Flight* paid a visit to the squadron now employing this new device in its work over the English Channel.

The reader may perhaps be wondering why it should be necessary to drop dinghies, which are single-seaters intended primarily for the rescue of fighter-pilots who have had to bale out over the "drink," since fighter-pilots themselves are equipped with dinghies stowed in a compartment of their parachute harness. The answer is that it has been found, in practice, that untoward things can happen to the pilot's own dinghy during the course of a combat which ends in his having to bale out, and more than one fighter-pilot has found, on

(Left) Loading the cylindrically packed dinghy and its container into the twin chutes in the fuselage of the Spitfire. They are joined at their lower ends by a short cord. (Right) The Mae West keeps the ditched pilot's head above water till help arrives, but he is hard to spot from the air.

SAMARITAN SPITFIRES

releasing his dinghy after a safe descent, that it was useless. It can, for example, become punctured by the fire from an enemy aircraft or by fragments of *flak*; or it may get torn during the process of a hurried departure from his aircraft under circumstances which do not permit of a really neat exit. This sort of thing does not always happen, of course, but it happens often enough to make the new device an extremely useful addition to the technique and equipment of the Air/Sea Rescue Service. The Spitfire, by the way, has replaced the Lysander because it is faster on the job and can take care of itself.

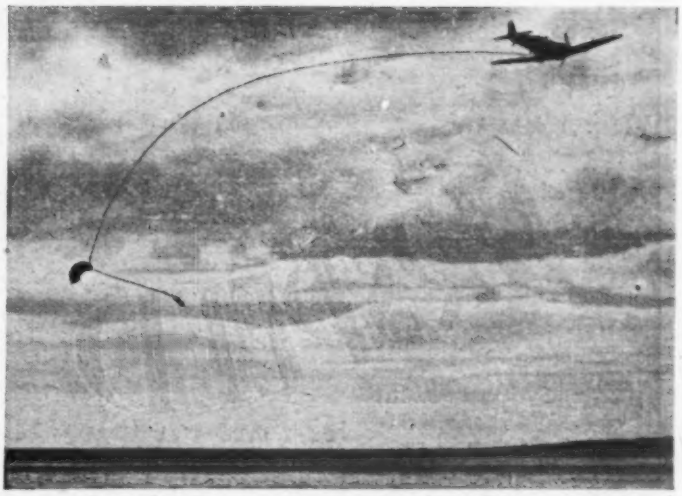
A feature of the dinghy dropped by the Samaritan Spitfire is that it sheds its case and inflates itself on its way down to the water, and as it is customary to drop it from only about 50 feet, it will be realised that the process is quick-acting.

Reverting to the question of accuracy of aim by the pilot who drops the dinghy; considerable latitude is provided by the fact that when dropped it trails 75 yards of floating cord. The rescuer approaches the ditched pilot in a cross-wind direction and releases the dinghy up-wind of his position in the water. Thus the dinghy, with its 75 yards of floating line, drifts towards him and he can grasp any part of the line nearest to him and pull the dinghy to him. Having scrambled aboard, a notice on the rim of the dinghy reminds him that the adjacent cord hanging over the side has a food and first-aid container dangling at its other end.

Before he drops the dinghy, however, the Spitfire pilot—having located "the body" (as they term, with a certain grim humour, the man bobbing about in his Mae West!)—first makes a dummy run and drops a smoke float, or maybe two. This serves a double purpose. First, it enables him to see his "target" position when he is approaching to drop the dinghy, for it must be remembered that even in a moderate sea a man is not easy to see and, during a low altitude approach, may disappear from sight between the waves so often that the pilot may lose sight of him at the crucial moment. But having dropped the smoke float as near as possible he will note its position in relation to the man, as he circles to make the final approach, and can check his aim.

The other function of the smoke float is to provide a wind-direction indicator for the Walrus pilot whom he will by now have summoned over his R/T to come and do the actual picking up. Should the sea be too rough for a Walrus, an Air/Sea Rescue launch will undertake this part of the job. The launch may be one of the R.A.F.'s own high-speed launches, or it may be a Naval launch operating with the Air/Sea Rescue Service, according to the circumstances.

Flight witnessed a demonstration of how well this new method works, from an Anson which circled over the scene of operations somewhere off England's southern shores, and would pay a tribute to the two officers most concerned, namely, F/O. T. Vacquier, who very nobly volunteered to be dumped, fully dressed beneath his Mae West, into the anything but warm waters of the English Channel from a Navy launch, and F/O. D. J. McBrien, D.F.C., who dropped his dinghy with such commendable accuracy that "the body" reached it exactly 12 seconds after it hit the water. McBrien laughingly remarked, afterwards, that this was a particularly lucky shot and that it is not always that the 75-yard of line is thus rendered unnecessary.



ON ITS WAY. Snapped just after release from the Spitfire, the dinghy, with container attached, is seen to be already half inflated; the floating line is paying out behind it as it falls.

While the Spitfire was locating his man, circling to drop a couple of smoke floats, and then circling again to make the final run which ended in dropping the dinghy within a few feet of "the body," a Walrus arrived over the scene and stooged around awaiting its own turn in the demonstration. In the meantime, our Anson, in the experienced hands of Flt. Lt. F. O. Dimblebee, swept down to "nought feet" to take a closer look at the gallant victim who by now had been in the water some little time and had only just received his dinghy and clambered into it. He waved gaily to us as we passed, and one could well imagine how joyfully any pilot, in a genuine situation like this, would greet the approach of an Air/Sea Rescue aircraft.

Incidentally, the occasion also provided us with the opportunity to appreciate to the full how extremely difficult it is to spot a man in the water even from a few hundred feet up. The bright yellow dinghy, on the other hand, was easily seen from a considerable distance away. It has to be remembered, however, that the green sea was lit by a bright sun and was reasonably calm; the work of the Air/Sea Rescue Service is far from being so simple when seas are rough and gloomy.

In due course the Walrus, flown by Flt. Lt. J. V. Renvoize, came to rest on the sea a suitable distance down-wind from "the body" in his dinghy, and taxied carefully towards him. This calls for considerable care and skill, but only 2½ minutes elapsed from the moment the Walrus touched down until the rescued man was hauled safely aboard.

It should hardly be necessary to add that the speed with which the ditched pilot can be got aboard the rescuing craft can sometimes be a vital factor in saving his life, and the performance put up during this demonstration spoke extremely well for the skill which is brought to bear

That it was not a special effort blessed by unusual good luck (in spite of F/O. McBrien's modest disclaimer) is borne out by the excellent record this Air/Sea Rescue squadron, commanded by Sqn. Ldr. R. F. Hamlyn, A.F.C., D.F.M., has established. Operating in three flights stationed at three convenient points, it was the first to reach its century in rescues which now total 177. Of these 83 were made during the present year with a month's record of 37 in June. After a recent raid on St. Nazaire it rescued 33 American Fortress pilots and aircrew within 24 hours.

Its pilots, by the way, are all either Battle of Britain veterans, bomber pilots who are "resting," or pilots back from the Middle East. Sqn. Ldr. Hamlyn, for example, had a bag of 13 Huns in the Battle of Britain; five in one day.

MANNA FROM HEAVEN: Having clambered aboard his rubber dinghy, the pilot has hauled in the precious container which holds food and, should he need it, a first-aid kit.

SPOILING THE GLIDE: With flaps down at 90 degrees to the wing, a Horsa comes in to land. The slow forward speed and tricycle undercarriage makes it suitable for landing in small areas.

Details of One of Great Britain's Troop-carrying Gliders

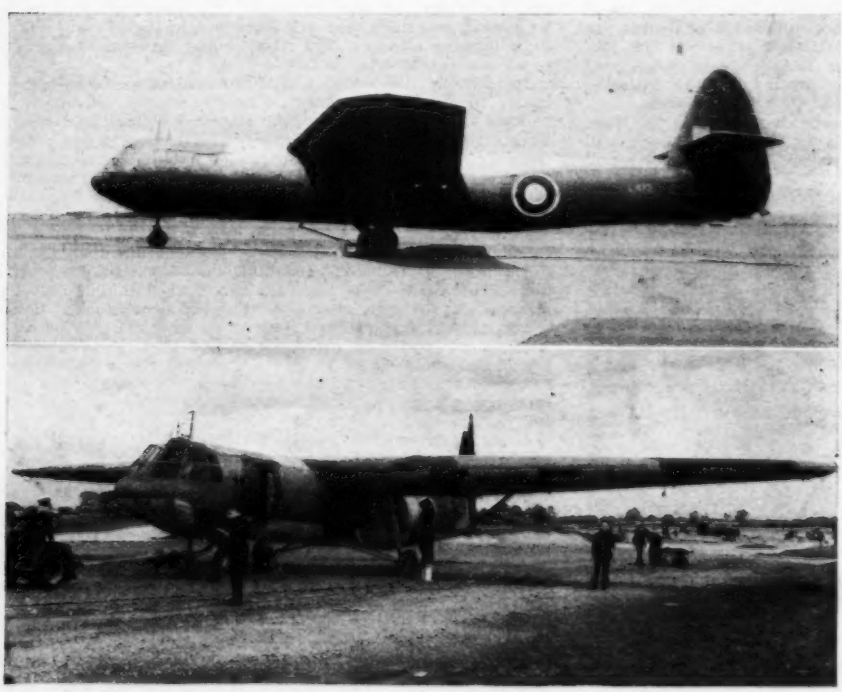
THE recent feat of towing a glider from Canada to the United Kingdom has focused attention on the possibilities of this form of air transport for carrying freight. From a purely military point of view the main function of a glider is, of course, the carrying of troops, the glider having certain advantages compared with the dropping of troops by individual parachutes. It is not that one takes the place of the other, but rather that they are complementary. The glider can be cut adrift from its tug and, if it is cast off at a substantial height, it can cover quite a respectable horizontal distance under perfect control, and in almost complete silence, and can land on almost any field, irrespective of size and surface conditions.

At one time the view was held that since troop-carrying gliders may have a very short life in any case, there is no need for great aerodynamic efficiency, nor for very high finish. There are several reasons why that argument is fallacious. Most obvious is the fact that if a power-driven aircraft is to tow several gliders, or tow one glider over a very long distance, its efficiency becomes important, since the drag has to be paid for in the form of power required by the tug. After casting off from the tug, the efficient glider can reach a more distant point than the less efficient.

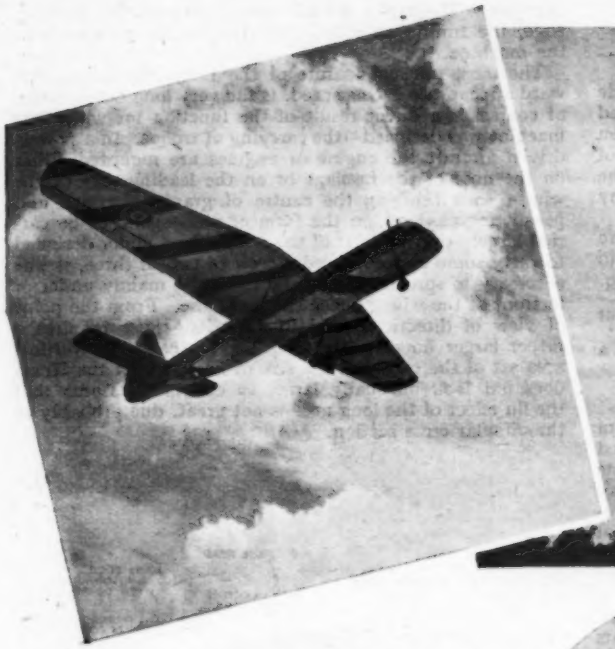
German sailplanes of the high-efficiency type produced as a result of the Rhön meetings had efficiencies of a very high order—gliding angles in the neighbourhood of 20:1. Such efficiencies were possible in the relatively light single-seaters used, as large wing spans and high aspect ratios, which kept induced drag down to a minimum.

In the much heavier troop-carrying gliders such aspect

(*Continued on p. 66.*)

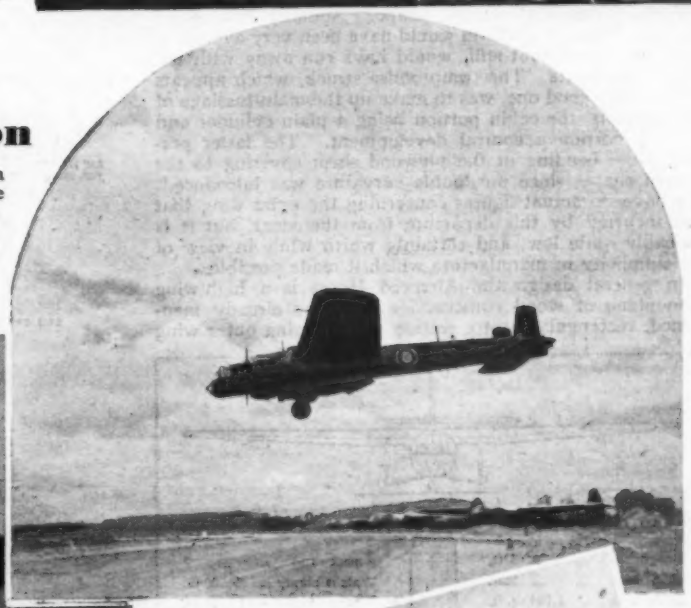


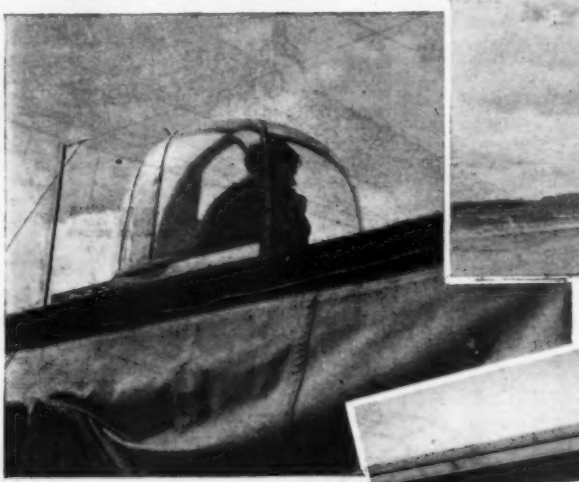
NIGHT AND DAY: (Top) A Horsa in its suit of "night" black paint. (Bottom) Dressed in day and training camouflage this glider is having the bridle tow ropes attached under the wings.

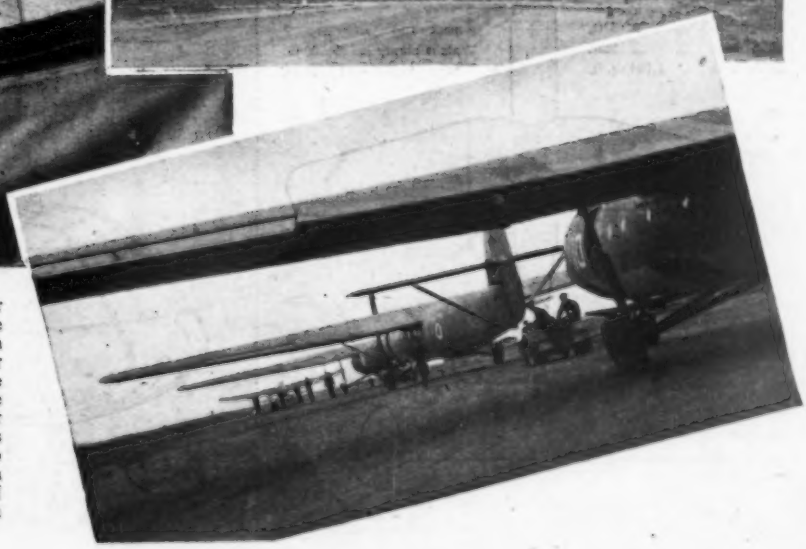


At a Horsa Station

(Top left) A Horsa coming in to land makes a colourful picture with its brown and green topside camouflage and its black and yellow striped underside seen against a blue and white sky. (Top right) The two-point bridle tow arrangement can be clearly seen in this picture of a Horsa towed by a Whitley.







(Centre right) Having passed their heyday as heavy bombers, the obsolescent Armstrong Whitworth Whitleys have been adapted for glider towing. (Above) The mobile glider-control office which orders the comings and goings of the trainer Horsas. (Right) A line of Horsas waiting on the runway to be picked up by their tugs. Towing by tractor from the point of landing to the point of take-off occupies a large proportion of the available flying time.

THE AIRSPEED HORSA

ratios are impracticable, and the fuselages cannot be made of quite the perfect streamline shapes which characterised the high-efficiency sailplanes. As an example of how, even in a troop-carrying glider, a very considerable degree of efficiency can be achieved without going to extremes, the Horsa glider designed by Airspeeds and built by many different firms is very interesting.

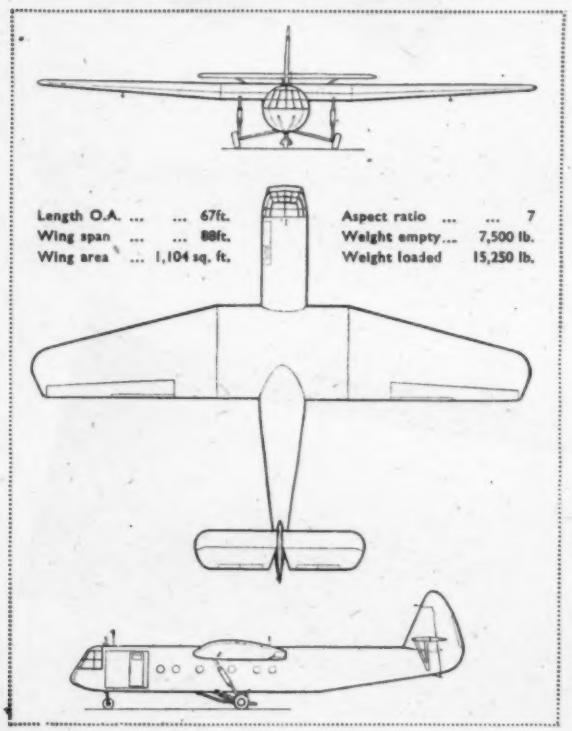
The wing span is 88ft. and the wing chord of the centre section is 15ft. 6in. The outer wing portions taper to approximately 8ft. at the tips. The wing area is 1,104 sq. ft. and the aspect ratio, calculated from $\frac{\text{span}^2}{\text{area}}$ works out at 7, which is sufficient to keep induced drag down to a reasonable figure.

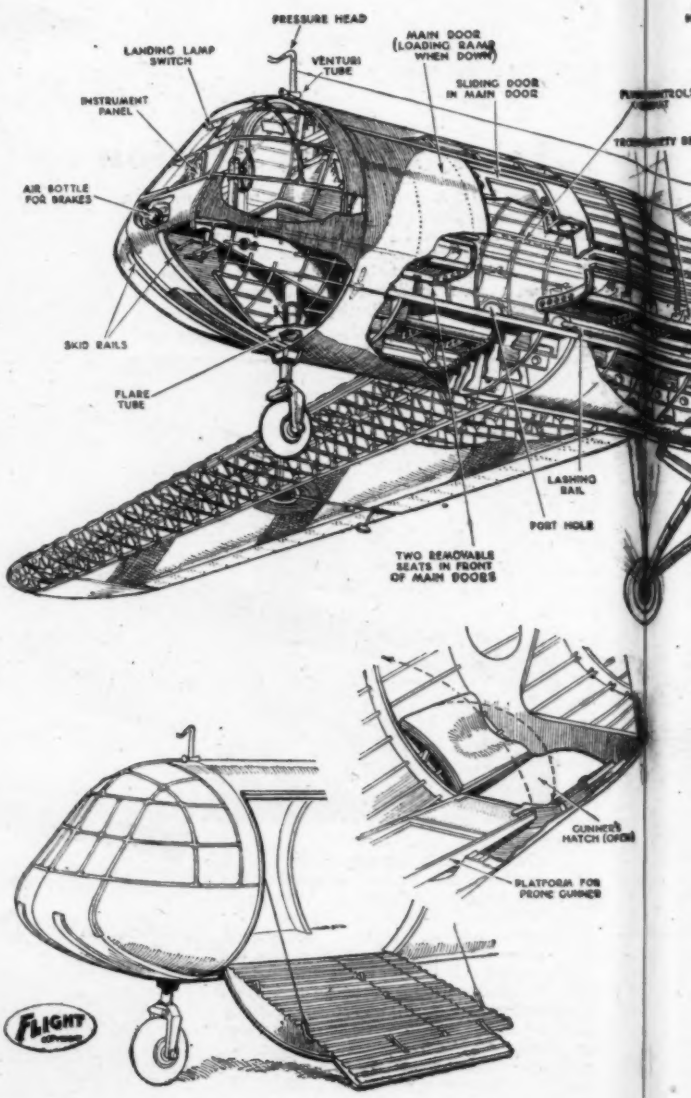
Outline Compromise

In the fuselage also one sees evidence of a deliberate aim at good streamlining. The extreme nose must be excepted from this, but since it was very essential that both pilots should have the best field of view possible (the glider may have to be landed in very awkward places) some aerodynamic efficiency had to be sacrified in the interests of such practical considerations. The rest of the fuselage *appears* to be of streamline shape. Actually this is not the case, since such a form would have been very expensive and, more important still, would have run away with too many man hours. The compromise struck, which appears to be a very good one, was to make up the main fuselage of two portions, the cabin portion being a plain cylinder and the tail portion a conical development. The latter permitted the bending of the plywood sheet covering to the desired shape, since no double curvature was introduced. We have no actual figures concerning the extra drag that was incurred by this departure from the ideal, but it is probably quite low, and certainly worth while in view of the simplicity in manufacture which it made possible.

In general design the Airspeed Horsa is a high-wing monoplane of wood construction with, as already mentioned, rectangular centre section and tapering outer wing portions. The taper, by the way, is all on the leading-edge, the trailing-edge being straight in the plan view of the machine.

The most unusual feature of the Horsa, so far as outward appearance is concerned, is the very long nose. This, of course, is a direct result of the function for which the machine was designed—the carrying of troops. In a power-driven aircraft the engine or engines are mounted either on the nose of the fuselage or on the leading-edge of the wings, thus bringing the centre of gravity forward and permitting payload, in the form of passengers, to be carried largely over and aft of the wing. In a glider designed to carry some 25 troops and a crew of two or three, it was necessary to spread the load by having it mainly under or in front of the wing; hence the long nose. From the point of view of directional stability the long nose requires a rather larger fin area aft, to bring the centre of vertical area aft of the c.g., but the size of fin fitted on the Horsa does not look unusually large, so one may assume that the fin effect of the long nose is not great, due probably to the circular cross section.





Notable in the design is also the tricycle undercarriage, which leaves the machine horizontal while the troops are emplaning or disemplaning. That applies to normal operation at home. For purposes of the "real thing," the undercarriage may be jettisoned and a landing made on the central skid and the nose wheel. In that case the machine heels over until a wing tip touches, but the hinged door is so designed that it folds down to form a sloping gangway for the troops. In any case, the distance from doorstep to ground is only 4ft. 6in., so that, for disemplaning, the jump is a fairly easy one. Usually there will not be quite so much hurry when emplaning!

Layout and Controls

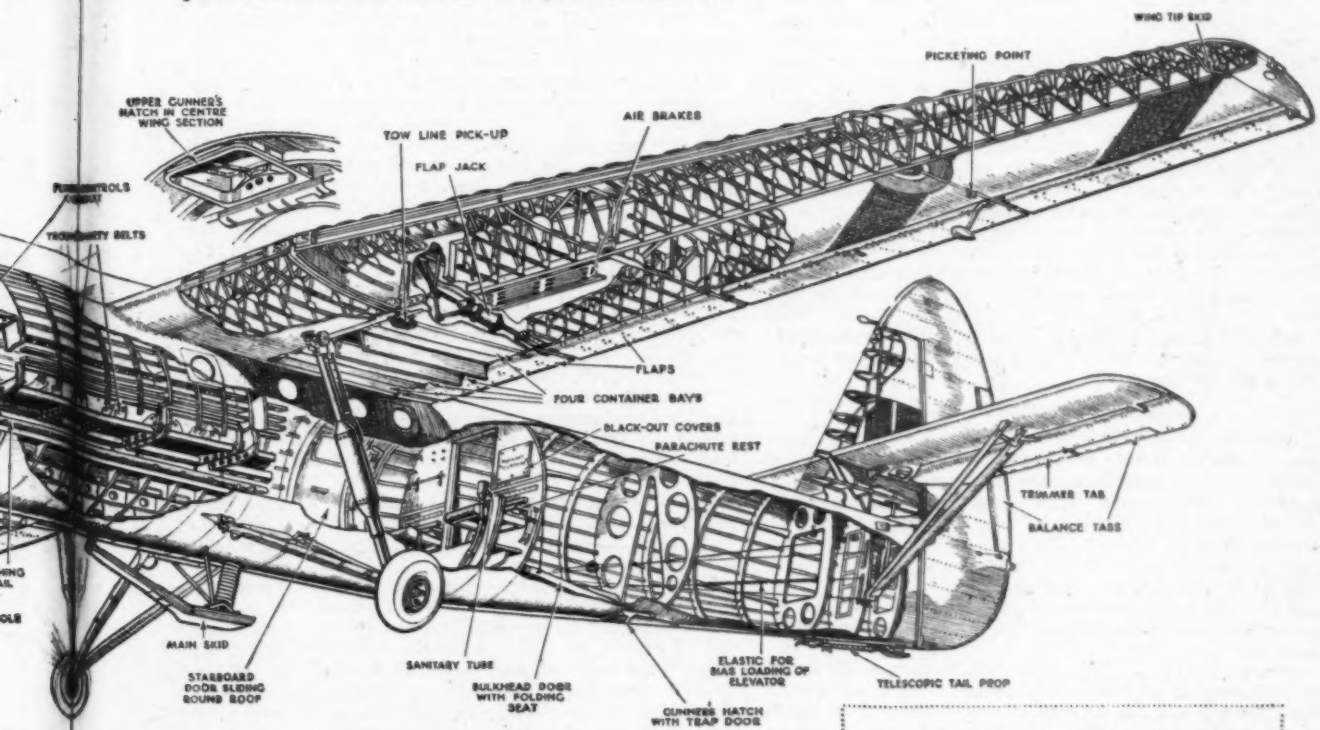
The internal layout of the Horsa is shown in the large drawing on these pages, as are also many of the structural features. Accommodation is normally provided for some 20 troops with their equipment, but certain removable seats can bring the capacity up to 25 plus a crew of two pilots. Provision has been made in roof and floor for a rear gunner, so that the machine is by no means entirely defenceless while in flight.

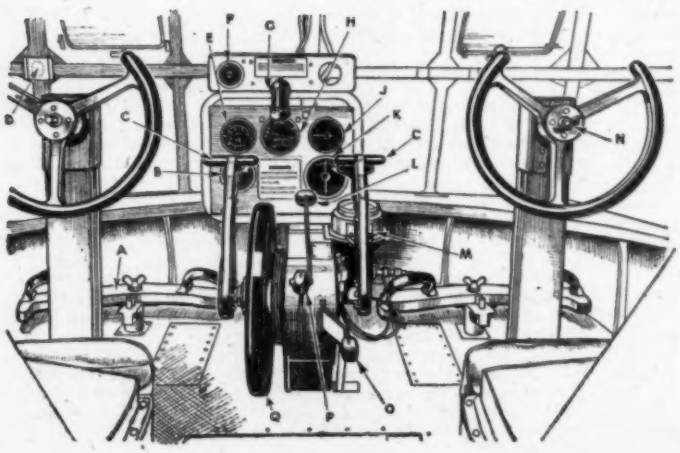
Full dual flying controls are provided for the two pilots. They are of normal type, and in addition to the main flying controls there are the usual trimming tab levers for elevators and rudder, and the controls for operating the flaps. The ailerons are of the slotted type.

In addition to the flaps, air brakes are provided. These take the form of "slatted" grids which normally lie buried in the wing, but which are lowered into the operative position by cable-operated actuating crank levers.

Twenty seats for troops are arranged alongside the two sides of the fuselage, partly in way of the wing and partly ahead of it. Another three seats run across the cabin, aft of the wing, while in front of the main door are two removable seats. The seats are of the tip-up type, with rests for parachutes behind them.

Normal wood construction is used in wing and fuselage. The latter is plywood covered throughout, but the wing is fabric covered from the main spar to the trailing edge.





A. S. 51 TRANSPORT GLIDER

DESIGNED to Ministry of Aircraft Production specification No. 26/40, the Horsa carries two pilots and up to 25 troops. Most of the features of the construction and layout are shown in the drawings. In the sketch of the cockpit the rudder bars are easily detached by undoing the wing nut A; B is the altimeter; C, air brake control levers; D, compass deviation card; E, airspeed indicator; F, air pressure gauge; G, instrument panel light; H, artificial horizon; J, rate-of-climb indicator; K, turn and bank indicator; L, tow-release control lever; M, compass; N, wing nut securing starboard control wheel; O, undercarriage jettison lever; P, flap-control lever; Q, elevator trimming wheel.

American War Cargo Types

Office of War Information Reports on Air Transport

ALTHOUGH it must be freely admitted that America's development of civil aircraft types was, and still is, considerably in advance of Great Britain's, it is clear from a report on air transport just released by their Office of War Information, that their position in this respect does not place them in such a favourable light in regard to war cargo as it does to passenger services.

The report plainly states, in fact, that "no planes originally conceived solely for the carrying of air cargo are yet in regular service in the Western Hemisphere," and it gives a list of the chief models of transport aircraft now in service, which indicates the extent to which America is making use of available aircraft, in the form of adapted passenger and bomber types, for the purpose of wartime air transport; the first of her aircraft specifically designed for the carriage of freight are, the report says, "still in the experimental stage at the present time," but it adds that in spite of this, impressive air cargo records are being made by the Army and Navy.

This means, however, that present-day cargo transportation is being accomplished with a degree of efficiency considerably below that which would conceivably characterise aircraft specifically built for cargo purposes, and the report cites the cargo version of the B-24 Liberator, the C-87, to illustrate the point. This aircraft, though it is doing excellent service as an air freighter, is so constructed that it requires its load to be carried in a concentrated location. Its capacity as a cargo aircraft is greatly limited by the lack of available space for loading within the fore and aft balance limits of its centre of gravity, and "balance officers" have to exercise great care in distributing the weight, particularly towards the tail, when supervising the loading.

Compromise Conversions

Aircraft originally designed for passenger work, too, have been found to be far from ideal for the cargo-carrying duties they are now faithfully performing; their loading facilities, doors, and cargo hold-down facilities are described as afterthoughts, and they are often too high for truck-loading platforms. The C-54 and C-46 (Skymaster and Commando respectively), which are modifications of the DC-4 and CW-20 passenger airliners, have greater capacity than the converted bombers, but are quoted as examples which suffer from some or all of the handicaps mentioned.

Present models of flying boats are even more ill suited to the carrying of bulky cargo, due to the small size of their hatches and the division of their hulls into compartments by bulkheads which for structural reasons cannot be removed. Furthermore, engine choice, fuel capacity, landing speed, and other features of these adapted aircraft are aimed at general all-round utility rather than designed for the greatest economical efficiency in the specific jobs they are now being called upon to perform as war cargo carriers.

In general it seems that an aircraft designed primarily to carry cargo could be converted to passenger work with less loss of efficiency than vice versa; or it could easily be converted to a bomber by the installation of guns and armour. At present, therefore, "American air transport needs are being filled by operations that show considerable ingenuity, but which cannot be called efficient from any modern requirement of cargo-carrying economics."

Mixed Company

Other converted civil types in use, besides those already mentioned, include the C-47 Skytrain and C-53 Skytrooper, which are military variations of the DC-3; the C-59, C-60 and C-66, which are variants of the Lockheed 18 Lodestar; the Boeing 307 Stratoliner, which is the Army's C-75; and the Boeing 314 Clipper and Vought-Sikorsky VS-44A Flying Ace flying boats. Older models also in use to a more limited extent are a few DC-2 airliners used by the Air Transport Command under designations C-32A, C-33, and C-34 for training purposes, and a few Lockheed 10E's which are the Army's C-36; the C-73 which is the Army version of the Boeing 247D and used for transport training; the Sikorsky S-42B and S-43 Clippers, and the Martin 130 China Clipper.

Other adapted bomber types in addition to the C-87 Liberator Express are the Consolidated Coronado, now being converted in quantity for Navy transport duties and known as the PB2Y-3R; the Martin Mariner, which as a transport is the PMB-3R; the Consolidated Catalina, a number of which have been modified for transport work with the Rubber Development Corporation in the Amazon Valley; and finally the Martin Mars, which has been fitted with a loading track and large hatches, and is now under development.

The first aircraft designed primarily as a cargo plane and now undergoing tests is the C-76 Curtiss-Wright Caravan. The Lockheed Constellation (C-69) is at present being tested as a troop-carrier.

Finally, there are three types which have not yet reached the flight-test stage. These are the Waco C-62, a twin-engined wooden cargo aircraft of 33,500 lb. gross weight, the Fairchild C-82, a part-metal 50,000 lb. air freighter with a rear door that can be lowered as a ramp and with an interior hoist; and the enormous Kaiser-Hughes HK-1 flying boat with eight engines and 120,000 lb. cargo capacity which has a wing span of no less than 320ft. and a length of 218ft. It is of all-plywood construction, and has a gross weight of 400,000 lb.

DEATH OF COL. BARRINGTON

WE regret to learn of the death at Detroit, U.S.A., of Lt. Col. Thomas Barwell Barrington, aged 58. Col. Barrington was for many years on the Rolls-Royce Company's design staff, and during the last war was in the Technical Section of the Air Ministry. When the Packard Company were given an order by the British Government two or three years ago to manufacture Rolls-Royce Merlin engines, Col. Barrington went to Detroit as liaison engineer. He was well known in automobile and aeronautical engineering circles.

POST-WAR PRODUCTION

THAT the established aircraft industry will, after the war, and after the probable cessation of work in shadow factories and the normal recession of labour to pre-war occupations, be on a stable basis was emphasised by Mr. T. O. M. Sopwith, chairman of the Hawker Siddeley Aircraft Co., Ltd., in his statement at the annual general meeting of the company. Mr. Sopwith did not accept the view expressed recently that the industry would be reduced to a fraction of its size. "We can," he said, "feel confident of our ability to fulfil such requirements as may be necessary, and I cannot contemplate any authority acting otherwise than to ensure a strong air arm."

NEW U.S. MARKINGS

BECAUSE the present markings of U.S. aircraft can be confused at a distance with those of the Germans and Japanese, a new design is to be adopted by the U.S.A.A.F.

This will consist of "a five-pointed star on a circular field of blue, with a white rectangle attached right and left of the circle, the whole surrounded by a red border."

The above description does not permit one to form a very accurate idea of what the new American aircraft markings will look like, since the term "rectangle" is a loose one and gives no indication of the proportions, nor whether these white rectangles will be attached with their long or their short sides adjacent to the circular field of blue.

Behind the Lines

Service and Industrial News from the Inside of Axis and Enemy-occupied Countries

Oil Discovered

THE German broadcasting station in Norway reports that new oil resources covering an area of approximately 3,000 hectares have been discovered in Northern Albania, in the district of Truja.

Regia's Call-up

A CALL-UP of the 1923-24 class, to be completed by July 18th, is reported from Rome. The majority of the men will be drafted into the Italian Air Force, and deferment will be granted only to students.

Submarine Aircraft Tender

ACCORDING to a report in the Italian journal *Tevere*, a submarine aircraft tender has been developed by the Italian Navy. The aircraft (probably a seaplane) has folding wings and is said to be housed in a hermatically sealed hangar on the side (?) of the submarine. A slip-way is located in front of the hangar.

Nazified Air France

FOLLOWING the suspension by the German authorities of all air routes operated by *Air France*, an agreement has been concluded between that company and the *Luft Hansa*. Under the mantle of this convention, *Air France* has transferred the equipment to the German organisation, and some of the air crews and ground personnel are to follow suit. The workshops of *Air France* at Marseilles-Marignane will continue to be staffed by French personnel, but will work for the *Luft Hansa*. In short, *Air France*, an organisation of long tradition and a pioneer of French air transport, has ceased to exist.

Axis Schemes

AS a part of their post-war planning, leading Axis air transport companies (probably including the *Luft Hansa*) are reported to have opened negotiations for the purchase of land on the French shore of Lake Geneva. Because of the geographical position of the lake in the centre of Europe, and the favourable atmospheric conditions in this region, it is said that these companies plan the establishment of a seaplane junction for post-war European air transport.

Satellite Effort

FOUNDED recently at Zagreb, the Croat Metal Factory is to engage on the manufacture of aircraft spares and equipment. The board of the company is composed of Milan Kiepach, an engineer in the Ministry of National Economy; Dr. Zvonomir Kralj, of the Ministry of Finance; Viekoslav Trputec, a marine engineer, and Rudolf Steiniger and Ernst Goetz. Since the latter two are directors of the *Wiener-Neustadt Flugzeugwerke*, it can be assumed that the new Zagreb company is in some way connected with the Vienna firm.

Paratroop Selection

FROM observations of parachute jumpers in Italy, Benedetto Casella arrives at the following conclusions: Injuries to parachute jumpers occur primarily in the contact surfaces between the body and the harness, generally on the trunk, and may occasionally be accompanied by nervous and digestive troubles. Twenty-five per cent. of fractures, sprains and dislocations in landings occur on ankle joints and wrists.

Based on the above experience, the writer recommends the application of the following standards for the selection of personnel for Italian paratroops:—

Age, below 35; absence of hereditary diseases or tendency to air sickness; height 5ft. 4in. to 5ft. 6in., with an evenly developed body and muscles; healthy bones; no flat feet or swollen arteries, etc.; good breathing; no chest deformations; no abdominal or nervous disorders; normal variation of blood pressure, and no marked pulse after knee-bending exercise; normal reflexes; correct functioning of the inner ear; good vision in both eyes; no colour-blindness, no defects of *conjunctiva tunica*. Necesary qualifications are also quick intelligence, school education, reaction time 0.15 to 0.20 sec., and a sound psychological behaviour in the psychological examination.

GERMAN JANIZARIES: Since February, 15 years old schoolboys are being recruited as so-called "Luftwaffenhelfer." They are employed not only for A.R.P. work but also for active air defence, such as operation of A.A. guns, etc., and are subject to the usual military discipline.

Continental Air

A PRIVATE Italian company is to establish shortly a new air service between Rome and Bucarest via Tirana and Sofia. The Service is scheduled to operate once weekly. Another service linking up Bucarest with Athens via Sofia and Salonika is operated by the state-controlled Rumanian "Lares" company.

Training

IN order to prepare potential recruits for Germany's satellite Croatian Air Force, a school for the construction of model aircraft has been opened in Zagreb. Over 300 pupils have been enrolled; they are divided into 16 groups, each of 20 boys. The courses, which last for three months, cover elementary theoretical subjects as well as practical training. Similar courses are said to exist in Sarajevo and in seven other provincial centres of Yugoslavia.

Regimented

WHILE hitherto the German and Italian technical Press has been regimented within the two countries, it is understood that plans are now being made for an inter-axis co-ordination. An Italian-German commission met at Venice to study a new statute for an "International Federation for the Technical Press," and will present its recommendations to the Italian and German Governments.

Carpet Bombing

COMMENTING on Allied air attacks on Germany a neutral correspondent deals with what the Germans call "carpet bombing." This method, said to be employed by American formations, both against ground targets and shipping, is described in the following terms: "After choosing the target the leader of the formation orders all his aircraft to drop their bombs simultaneously, and if the target is correctly aimed at, the salvo covers it completely." From a further description it appears that the Germans consider this method more effective against ground objectives than against coastal convoys where, in addition to fighter interference, the movement of the targets increases the probability of misses.

Referring to German defences, the correspondent says that Berlin military circles consider that at night fighters show better success, since in daylight bombers fly in close formation, while at night their formation is looser and it is easier for the fighters to get at them.

Fifty-seventh of the Latest Recognition Series

Aircraft Types and

MITSUBISHI 96-2a (NAVY)

A FORERUNNER of the now more familiar "Zero" fighter, the Mitsubishi 96-2a is a single-engined, single-seater fighter equipped for deck landings, but although primarily a Navy type it has been (and perhaps still is to some extent) used by the Japanese army both as a fighter and for dive-bombing. Earlier models were fitted with a 550 h.p. Kotobuki engine, which was in effect a nine-cylinder air-cooled Bristol Jupiter radial engine manufactured under licence by the Nakajima concern, but this was replaced more recently by a 730 h.p. Mitsubishi Kinsei engine, also a nine-cylinder air-cooled radial and virtually the Pratt and Whitney Wasp design. The Japs originate extremely little but do plenty of cribbing; they are, in fact, the world's most prolific copyists!

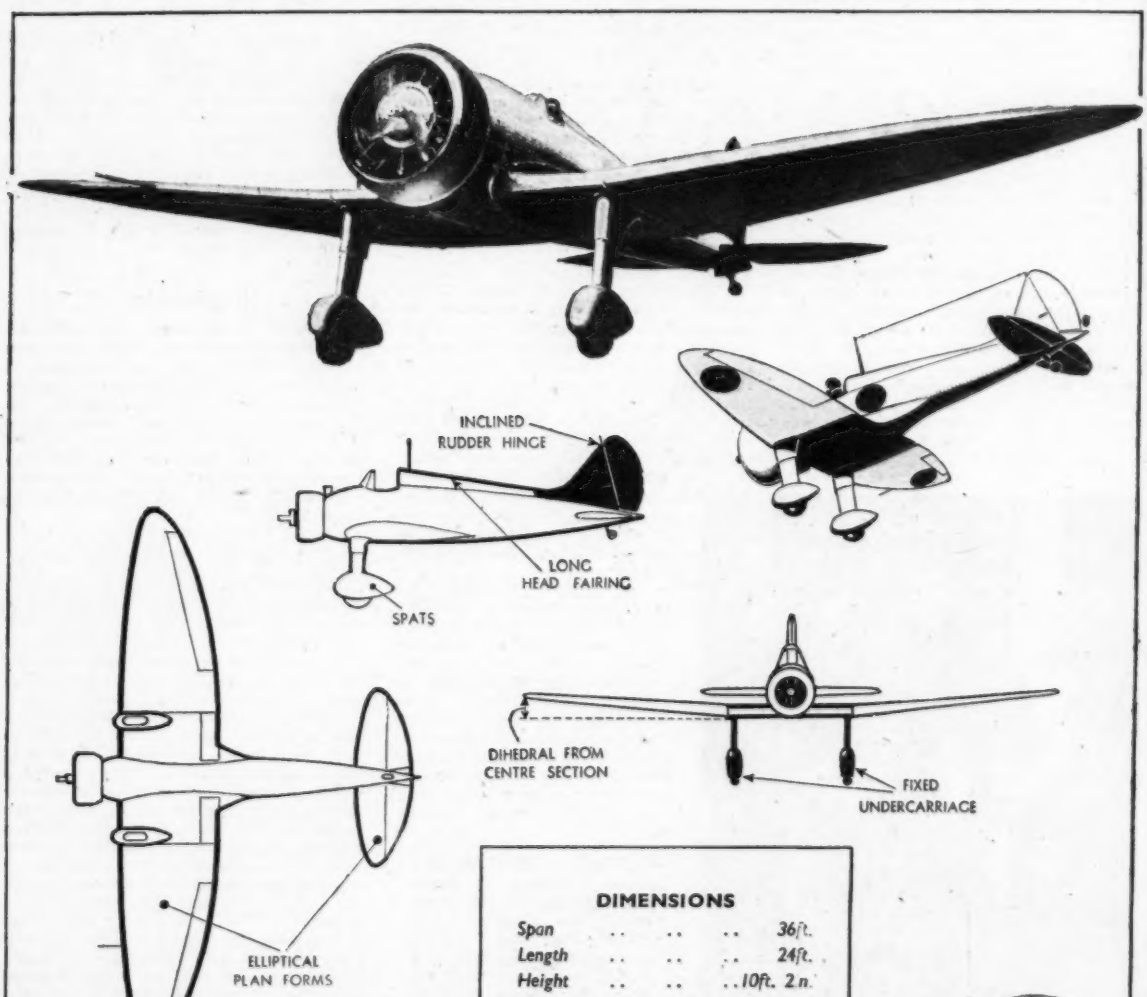
Incidentally it was one of these fighters which, when operating in China, had a large portion of one wing shot away and yet got home safely, so there could have been little wrong with their workmanship then, at any rate.

Of all-metal construction, the Mitsubishi 96 fighter has a wing plan very similar to that of the Spitfire; the tailplane, however, is also elliptical. But it bears no other resemblance to the British fighter, for with a fixed undercarriage, its top speed is only 250 m.p.h., while its armament is limited to a pair of 7.7 mm. machine guns mounted in the fuselage and firing through the airscrew disc, though later models are believed to have had an additional pair of guns in the wings.

Other available performance figures are: service ceiling 31,000ft., cruising speed 217 m.p.h., and range 440 miles. Wing flaps are fitted, and the cockpit fairing extends right back to merge into the fin.

Another, and unusual, feature of its design is that the rudder is hinged to the fin at a forwardly inclined angle, the apex of the vertical surfaces thus being part of the movable area.

Dihedral is from a flat centre section.

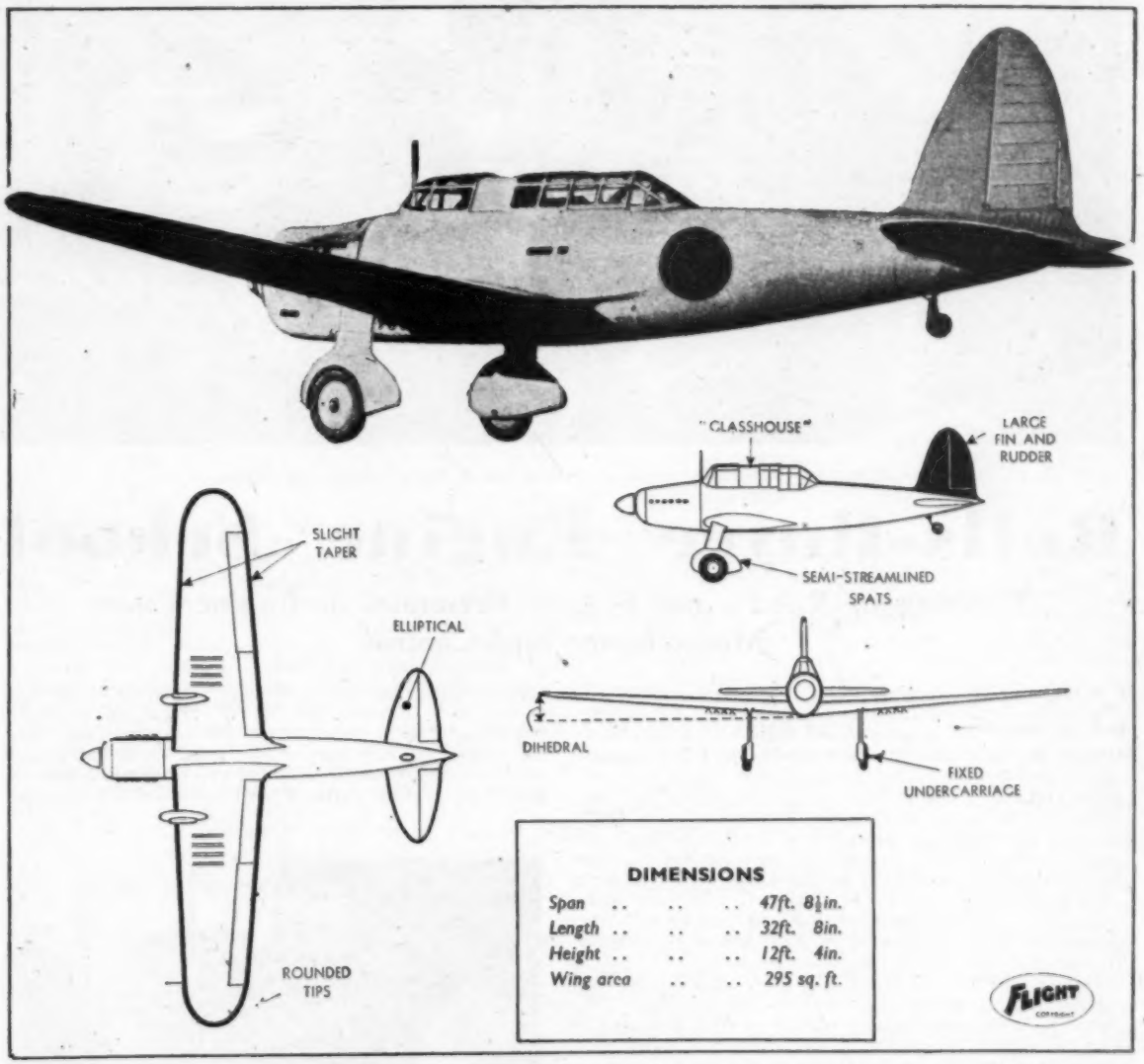


DIMENSIONS

Span	*36ft.*
Length	*24ft.*
Height	*10ft. 2in.*
Wing area	*141 sq. ft.*

heir Characteristics

KAWASAKI KB-97 (ARMY)



DIMENSIONS

Span	*47ft. 8½in.*
Length	*32ft. 8in.*
Height	*12ft. 4in.*
Wing area	*295 sq. ft.*

DESIGNED in 1937 as a replacement type for the KB-93 biplane, the Kawasaki KB-97 was the first monoplane light bomber to be used by the Japanese. It was, needless to say, a vast improvement on its forerunner, though it was powered by the same 900 h.p. Kawasaki V-type liquid-cooled in-line engine which had been used in the earlier biplane. It proved to be equally useful for reconnaissance duties, and a number of squadrons which had been using Nakajima T-94 two-seater biplanes for observation duties were re-equipped with KB-97s in 1938.

All-metal construction with light alloy stressed skin covering is employed except that ailerons and tail control surfaces are fabric covered. The split trailing-edge flaps, however, are metal covered. The fuselage is an oval section structure of light alloy with an aluminium alloy stressed-skin covering. The fixed cantilever compression legs of the undercarriage are enclosed in fairings and have spatted wheels which are, however, exposed on the outside.

Defensive armament consists of either one or two synchronised 7.7 mm. machine guns mounted in the fuselage, and a manually operated "free" machine gun of the same calibre in the rear cockpit.

Bombs are carried internally, but wing racks are also available, and the fuselage has a good aerodynamical form and smooth exterior finish. In spite of its fixed undercarriage, this aircraft is credited with a top speed of 236 m.p.h. at 13,000ft. Its operating speed is 206 m.p.h., service ceiling 25,000ft., and cruising range 490 miles. Loaded weight is given as 7,000 lb.

The KB-97 is still in service, but the latest version has spats completely enclosing the upper part of the wheels, and a fillet between the leading-edge of the fin and the fuselage. It has been used in all Japan's theatres of war, including China, Malaya, Burma, Borneo and the Dutch East Indies.

A lecture on the supercharger in progress in one of many excellent classrooms.

Rolls-Royce Engine School

Training of R.A.F. and F.A.A. Personnel in Engine Care, Maintenance and Control

SOME day the complete story of the work and success of the Technical Training Command, R.A.F., may be divulged. No doubt it would begin with an appreciation of the tradition of craftsmanship laid down much earlier by Lord Trenchard in the Halton School of Technical Training. The pre-war ex-Halton apprentices provided to a large extent the essential nucleus upon which to build the enormous expansion of the R.A.F. fitter and rigger trades, but war necessitated new methods to cope with the colossal problem of technical training in the form of manufacturers' courses. From time to time such establishments have been described in *Flight*, and recently, by permission of the Air Ministry, we have had an opportunity to visit that provided by Rolls-Royce, Ltd.

During 1938 the late Mr. E. Platford, himself one of Sir Henry Royce's original apprentices, selected Mr. C. L. Hinings, the present superintendent of the Rolls-Royce Engine School, to create a department of organised specialist instruction on the Merlin engine, then just going through its teething troubles in the R.A.F. He being a man of vision, possessing exceptional technical experience combined with a knowledge of what the R.A.F. required, the school quickly achieved the high standard demanded and associated with the Rolls-Royce organisation.

The Rolls-Royce Aero Instructional School is the oldest of its kind in the country, and possibly, in relation to its specialised application, in the world. It was functioning as a complete and integrated unit a year before the outbreak of war. Apart from its basic applications to the R.A.F. it has provided aircraft-engine training for a large variety of allied requirements. For example, at the beginning of the war, Rolls-Royce stopped entirely the production of motor car engines and chassis, thereby releasing a large number of valuable men with exceptional experience of internal combustion engines, but unfamiliar with aircraft-engine applications and peculiarities.

It was essential for them to become familiar with the aircraft engine, and almost overnight, upon the instructions of the works director, Mr. E. W. Hives, an additional school came into operation for this purpose. Men from this school are now holding key positions in the aircraft section on the technical staff, and as service representatives at R.A.F. stations, airframe contractors, and repair depots.

Mr. C. L. Hinings, supt. of the R.-R. school. A certain informality and friendly approach, he claims, provides the best background for the intensive work necessary in these short-duration courses.

ROLLS-ROYCE ENGINE SCHOOL

Another type of trainee began to arrive in small numbers but nevertheless an important type due to the development of Merlin engines as marine power units. As the training programme of the R.A.F. expanded, service and civilian instructors came to the Rolls-Royce school in increasing numbers, and still continue to do so, in order to obtain the very latest information which they in turn must impart at the conclusion of the course to the new trades of flight mechanics and fitter II Es going through the School of Technical Training at other centres.

The School, as an Aid to Production

During 1941 the Fleet Air Arm, assisted to the limit of possibilties by its parent R.A.F. training organisation, was still confronted by problems in the rapid training of air mechanics fresh and raw from civilian life. In this case no Halton tradition existed within to carry on whilst they gained experience. In view of the numerous types of Rolls-Royce engined aircraft used in the Fleet Air Arm, an offshoot of the main R.A.F. school appeared, also under the administration of Mr. Hinings and his staff of instructors—The Rolls-Royce, Ltd., Fleet Air Arm Instructional School—and this is a story in itself. Quite apart from Merlin training for ground personnel, over 1,000 pilots and flight engineers have passed through a specially devised course on the technique of handling Merlin engines in flight, based upon the theory that better handling in the air means less work on the ground.

An outstanding feature of both schools is that the attitude of Rolls-Royce, Ltd., towards them is one of such enthusiasm as to give them an importance and priority almost equalling that of production itself. Such an attitude is undoubtedly justified, for in a sense they are part of the production effort; their teaching not only ensures that engines last longer but that they shall give better service. It also reduces considerably the necessity for replacements which otherwise would inevitably become general from bad handling in flight.

Mr. H. J. Swift, general manager of engine production, regards the schools as a pet project and encourages close co-operation with them from all departments under his control. As a result, the schools stand high in the esteem of the Services.

Mr. Hinings, superintendent of the school, has always felt that a relaxation from normal service routine and a certain informality and friendly approach provide the best background for the intensive work which is necessary in these short-duration courses. Incidentally, the mechanic's course lasts for only eleven days, and the pilot's course four days. Consequently the airmen get the best out of their stay, and are comfortably housed by a system of billeting controlled by the school superintendent. Furthermore, having himself been a sufferer from that form of teaching which involves the writing of laborious longhand notes, possibly drearily dictated, the planning of the work has always been laid out in a manner which avoids that pitfall and retains the trainee's interest.

At the controls of the school test bench. High-altitude conditions are simulated by closing the sliding doors over the aperture shown at the bottom of the photograph. Fuel flow-meters can be seen on the left.

Fleet Air Arm Training in Requisitioned School

The lecturers and group instructors are taught to regard themselves as leaders in discussion, to be glad to have questions brought up, to encourage argument, and to clarify points in doubt. Presenting technical enquiries upon the intricacies of the Merlin group, one was very impressed with the clear and concise manner in which the instructors were able to answer questions. And they did so with an obvious desire for more, so that it was difficult to decide who were the more enthusiastic, the instructors or their pupils.

It is probably true that no man knows all there is to know about the Merlin engine, but the staff of the instruction schools have behind them the whole Rolls-Royce organisation from which it can choose the appropriate authority, and the R.A.F. and F.A.A. do, we understand, ask some very awkward questions at times.

Carefully prepared syllabuses and timetables for the various courses going on during our visit suggested that the usual high standard of thoroughness and efficiency associated with Rolls-Royce, Ltd., also pervaded the school of instruction. Sound psychology and a comprehensive knowledge of the duties fitters and engineer officers have to do, have enabled Rolls-Royce instruction to carry on for five years without basic criticism of its methods, during which

The school workshop, in the charge of Mr. R. Smith, who is seen on the left, where the magnificent sectionised assemblies of engine parts, pumps and viscosity valves displayed throughout the school have been produced.

ROLLS-ROYCE ENGINE SCHOOL

time 7,500 trainees of all types have passed through the school. The growth is shown by the fact that of the above total over 3,000 passed through courses during the last year.

Work at the school on Merlin running and maintenance is divided into five sections, of which four are carried out parallel and identical on R.A.F. types of Merlin, and one, situated in a requisitioned school about a mile distant, is devoted entirely to Fleet Air Arm training. Each section is completely self-contained with a section head, who is also a trained lecturer, and a staff of three or four assistant instructors, each dealing with small groups of between six and eight personnel. Each section is provided with its own kit of engines on erecting trestles, with at least one type of each of the single-speed and two-speed supercharger series, and one of each type of carburettor. Lecture rooms have their own applicable set of sectioned parts and assemblies, particularly in the Fleet Air Arm school, which lends itself to display purposes. These sectioned models are probably the best to be found in the country; they are an invaluable aid to instruction and most magnificently produced in the workshop of the school.

Twenty-four Years Ago

The instructor mainly responsible for this work is Mr. R. Smith, who was the Rolls-Royce representative in Newfoundland when Alcock and Brown set off in the Falcon-engined Vickers Vimy upon their historical flight across the Atlantic in 1919.

The practical side of the course consists mainly of small groups, each working round an engine.

No attempt is made to instruct on the complete dismantling and erection, nor in overhaul detail. The sole purpose of the instructional "strip" is covered by Mr. Hinings' dictum that a man cannot service and maintain an engine unless he is fully aware of what goes on inside that engine. Great importance is attached to such points as cylinder block changing and reduction gear serviceability, with necessary checks following a shock loading, for example, when an aircraft goes over on its nose. Also carburettor functioning and tuning, valve and ignition timing, engine-control settings, and that complicated box of tricks, the automatic boost regulator.

At the end of the course a short written examination is held, and partly on the results of this, but mainly by the individual knowledge obtained by group instructors in close contact with the airmen during the course, individual reports are made to Technical Training Command. It is claimed that this method of assessment as a running commentary on a man's keenness, workmanlike attitude whilst around the engine, intelligence of questions asked, and general character, is more likely to be accurate than the results of a written test following a short, intensive course with little time fully to digest the information imparted.

Eng. Off. Training

A small Engineer Officer Course has also been worked up on lines agreed to in close consultation with the Engineer Staff of the Commands. This is concentrated upon such material as defect investigation and analysis, reasons underlying modifications, the later types of Merlin, and projected types on the point of going into service.

Probably the most outstanding achievement of the Rolls-Royce Instructional Staff has been its intensive work to improve the technique of pilots in handling their engines in flight. During this course the advantages conferred upon them by the advent of the constant-speed airscrew are fully imparted. A tradition had apparently grown unchecked that Merlins and other aircraft engines required to be run in the upper range of their permissible r.p.m., and further, that it was dangerous and harmful to the engine to depart from this ruling.

The constant-speed governor control was thus deprived of its most useful function as a means whereby the engine could deliver the power required in cruising flight at a lower r.p.m. setting, combined with a throttle-maintained boost in which conditions the gallons per hour consumption showed great economy.

Practical work in progress. A typical class engaged in removing the cylinder block of a Merlin.

To develop a clear and convincing argument on the subject of range and endurance flying from the engine and aerodynamic aspect, visual demonstrations were essential. This was to form the core of a pilot's handling course, which would also deal with other aspects of engine technique, such as high-power conditions for take-off, climb, and combat flight. For this purpose an engine test bed, complete with Merlin engine and Rotol constant-speed airscrew, has been installed. Devices for simulating high altitude conditions of flight are incorporated, and within the control house, in addition to the usual instruments, are fuel flow meters whereby the pilot pupil can actually see in a most convincing manner the advantages to be gained by following the instructions given.

A marked improvement has been noticed from an analysis of log books and fuel reports as a result of this course, and the younger generation of pilots are now being saturated in these methods, with the result that the general standard of engine handling in flight is considerably improved.

Two separate courses for pilots assemble each week. One is devoted to fighter types, and in this Fighter Command co-operates to the fullest extent, even posting two senior pilots to act as instructors within the school organisation. The other course is mainly for multi-engined aircraft crews, and at one time was responsible for the only training scheme in the country for flight engineers on Halifax and Lancaster aircraft.

The following advice is prominently displayed on the wall of the classroom, and is perhaps of rather more than general interest:—

DON'T

Fly at night
Either fast or slow
With your revs too high
And your boost too low,
Or you'll run out of juice
With a long way to go,
And you won't get home in the morning.

It is understood that, in the near future, members of the W.A.A.F. will also be posted for instruction at the school, and the instructional staff are already very proud of the fact that Miss Parker, the first qualified flight engineer of A.T.A., has passed through both the engine-handling and maintenance courses with success.

CORRESPONDENCE

The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters.

REVERSIBLE-PITCH AIRSCREW

To Shorten the Landing Run

A WHILE ago you referred to authoritative figures proving that such airscrews would be nowhere nearly efficient enough to check the speed of a dive bomber. These one must accept.

"K. V. P.'s" letter in your July 1st issue mentions another use, however—one, indeed, which seems to me to be important beyond dispute—namely, the employment of "negative thrust" to shorten the landing run.

At slow speeds aerodynamic considerations scarcely enter the discussion, and it seems fair, to judge purely from experience, to assume that the deceleration caused by two engines "going backwards," full-bore, should be of the same order as the acceleration produced by the same engines in starting from rest.

As with modern tricycle undercarriages, the landing run presents far greater problems of space and time than the take-off run, it seems reasonable to press for the introduction of reversible-pitch airscrews solely for this purpose, regarding any power of deceleration in flight which they might be found to provide as a pure bit of "buckshee" good luck.

"DRIVER."

BOMBER ARMAMENT

Changes Interfere with Production

I SHOULD like to reply to Mr. A. T. Henshaw's letter published in your July 1st issue, which deals mainly with bomber armament.

First, he presses the need for heavier-calibre guns to be installed in our heavy bombers, and then contradicts himself by saying that such installation would affect the present heavy bomb load, which he admits is of supreme importance.

Secondly, it must be borne in mind that 0.303 cal. m./guns have been our standard armament in this war, and production of these, together with ammunition and turrets for them, is now in full swing. The very fact that the nose armament of the Halifax has been reduced indicates that experience has taught us to consider defensive armament *after* speed, bomb load, and range. Therefore, it seems that the need for heavier-calibre guns is not sufficiently urgent to warrant the delay which would inevitably result from the change-over in production.

As to why the Americans bomb from high levels, it is presumably to minimise the danger from anti-aircraft fire, fighters being dealt with very effectively by the thirteen m./guns which are carried. It should be remembered that the Lancaster attack on Le Creusot was made over weakly defended territory, and also had that invaluable element of surprise. If the enemy were prepared for such attacks he would soon devise something to prevent them. A balloon barrage, for instance, would have a disastrous effect on scores of heavy bombers flying at low altitude *and* in close formation as the Fortresses do when attacking.

I think that there is little doubt that the Americans are using "heavies" as profitably as it is possible to do in daylight.

C. C. COWEN
(D/S Att. 154 Sqdn. A.T.C.).

A Matter of Primary Function

RECENTLY in your Correspondence page there has been somewhat of a controversy regarding the merits of the 0.5in. and 0.303in. machine-guns, and I feel I must put in a word for the armament of British bombers.

Most of your correspondents apparently lose sight of the fact that they are talking about bombers and forget that the bomber's chief weapon for offence lies in its bomb load, and not in the number of guns it carries, so that a better argument is to compare the 2¼-ton bomb load of the Fortress with the 8-ton load of the Lancaster (on short range, of course) rather than compare the Lancaster's 0.303in. guns with the 0.5in. of the Fortress.

And please do not forget when the Air Ministry talk about 8,000-lb. bombs that they are almost twice the weight of a single Fortress's total bomb load. But to get back to the question of machine-guns.

The armament of a heavy bomber is (or should be) purely defensive, as a bomber's job is to bomb and not shoot down enemy fighters, however desirable that may be.

If Fortresses attempted night raids into the heart of the Ruhr they would not be in a position to fly in protective formation, and their 0.5in. machine-guns would be no use against the 30,000 anti-aircraft guns which the Germans claim help to defend the Ruhr.

I would like to add that the Air Ministry and British aircraft industry know what they are doing. Two examples of this which can be referred to here are:—

1. When a good many people were clamouring for a "tank buster" we had one which is the best weapon in the world for the job—the Hurricane IID.

2. When a number of persons were saying that, however good the heavy bomber was, we wanted a high-speed day bomber again, we already had the best weapon in the world for the job—the D.H. Mosquito.

So, as a word of advice to any persons who think we lag behind in the air, I would say that the British censor is very strict.

V. REDMAN (488 Squadron A.T.C.),

SAILPLANE EFFICIENCY

Pendulum and Weathercock Problems

The Pendulum and Weathercock were flying hand in hand,
Each chortling long and loudly as they wiggled to and fro,
"Do you think," cried they with glee, "we'll ever make the land?"
"I doubt it," moaned the pilot, "I'm much too ill to know."

—J. D. W.

MR. J. R. BROWN is most refreshingly naïve with his weathercocking sailplane and pendulum tail plane—rather reminiscent of a duck! One suspects he has not flown or has missed the significance of the various parts of an aircraft with which one is familiar.

Whilst conceding the rudder to be replaceable by modern theory, the elevators are not, which brings us right back to the mysteries of aerofoils and lift. Lift produced by any aerofoil section worthy of the name is a function of the angle of attack or inclination of that section to the airstream and to the relative speed of that air flowing around the section. For each value of speed v and angle α there will be a different set of twisting moments about the centre of pressure CP.

When resolved, these moments will have to be in equilibrium, otherwise the wing and consequently the aircraft will porpoise. The tailplane has the happy purpose of damping out this longitudinal "hunting" within small limits, and the controllable elevators take care of the bigger bumps and gusts. Let me say here that this is not half what actually happens, and is only serving to make my point. Elevators are not only handy things to have around the craft, but are absolutely essential, and they must be under accurate and light control with plenty of "feel"—ask any pilot!

How, let Mr. Lawson ask himself, is he going to control a sailplane to claw a few more feet of altitude against a jealous gravity and no b.h.p. to help, without an elevator? Still worse—how will he land?

"Flying-on" technique, maybe, shows promise with brakes and a deal of space, but I cannot think of anything more irritating during a landing approach than a jammed or flapping elevator control, to omit the fearsome thought of a pendulum-controlled surface working its malicious will with the horizon.

All the same, such an approach would be the sight of a century—viewed from a distance!

Sorry, Mr. Lawson, but you did ask for it!

J. D. WALSH (A.F.R.Ae.S.).

Gas Turbines and Jet Propulsion for Aircraft
By G. GEOFFREY SMITH, M.B.E.
A second edition of the above booklet is now available from "Flight" publishing offices. The new work consists of ten chapters and includes many illustrations. Price 3/6 plus 3d. post

SERVICE AVIATION

Royal Air Force and Fleet Air Arm News and Announcements

Awards

Fleet Air Arm

THE KING has been graciously pleased to approve the following awards:—

For bravery in successful air attacks on enemy shipping in the Mediterranean:—

Distinguished Service Cross

Temp. Lt. (A) I. D. FRASER, R.N.V.R.
Temp. Sub Lt. (A) C. T. WHITE, R.N.Z.N.V.R.

FOR skill and tenacity in air attacks on enemy shipping in the Channel area:—

Distinguished Service Cross

Temp. Lt. (A) S. M. P. WALSH, R.N.V.R.

Mention in Despatches

Temp. Act. Lt. Cdr. (A) W. F. C. GARTHWAITE, D.S.C., R.N.V.R.
Temp. Sub Lt. (A) G. McI. PATRICK, R.N.V.R.

FOR courage and prompt action in fire fighting when an airdrome in the Middle East was attacked by enemy aircraft:—

Mention in Despatches

Ldg. Air Mech. W. R. WOOLTAMS.

Group Officer S. F. Wynne-Eyton who commands the W.A.A.F. in the Middle East.

A U.S. Navy Ventura dropping a 22in. torpedo. From the angle at which it is falling there seems to be a possibility that it may break or at least bounce.

FOR bravery in skilful and determined attacks on enemy shipping in the Mediterranean made from the air:

Distinguished Service Cross

Lt. (A) D. E. C. EYRES, R.N.
Temp. Lt. (A) J. W. F. Jameson, R.N.V.R.
Temp. Sub-Lt. (A) R. A. L. Black, R.N.V.R.
Temp. Sub-Lt. (A) C. G. HURST, R.N.V.R.

Royal Air Force

THE KING has been graciously pleased to approve the following awards in recognition of gallantry displayed in flying operations against the enemy:—

Distinguished Service Order

Act. Wing Cdr. L. CROOKS, D.F.C., No. 426 (R.C.A.F.) Sqn.—This officer's courage and skill were admirably demonstrated during a recent attack on Duisburg. When approaching the target his aircraft was raked by cannon fire from an enemy fighter. Wing Cdr. Crooks skilfully evaded the attacker but his aircraft had sustained much damage. Although one aileron and half the port tail plane had been shot away, while the hydraulic and electrical systems were rendered inoperative, Wing Cdr. Crooks flew the bomber back to this country. Unfortunately, it was impossible to effect a safe landing, but, when the crew were forced to abandon aircraft, all descended safely.

Act. Wing. Cdr. R. BERRY, D.F.C.—In the campaign in North Africa this officer participated in a large number of sorties and displayed great skill and leadership. Wing Cdr. Berry has destroyed seventeen enemy aircraft.

Act. Wing Cdr. A. C. DEERE, D.F.C.—This officer has displayed exceptional qualities of skill which has played a large part in the successes of formations he has led. Wing Cdr. Deere has destroyed 19 enemy aircraft.

Act. Wing Cdr. J. E. JOHNSON, D.F.C., R.A.F.V.R.—This officer has led a wing on a large number of occasions. During an operation one morning in May, 1943, his formation was heavily engaged by a large force of enemy fighters. In the ensuing combats four enemy aircraft were destroyed without loss. The same afternoon he took part in a similar sortie and three enemy fighters were destroyed, one of them by Wing Cdr. Johnson. The next day, this officer took part in another successful sortie. He has destroyed at least thirteen enemy aircraft.

F/O. R. J. PHILLIPS, R.A.F.V.R., No. 114 Sqn.—In April, 1943, this officer was the navigator of the leading aircraft of a bomber formation detailed to attack enemy airfields at La Fauconnerie. Whilst over the target area the formation was subjected to heavy anti-aircraft fire. F/O. Phillips sustained a wound in the foot, which was almost severed. Although in considerable pain he continued to direct the formation to the target which was successfully bombed before he collapsed.

Bar to Distinguished Flying Cross

Act. Sqn. Ldr. K. F. THIELE, D.S.O., D.F.C., R.N.Z.A.F., No. 467 (R.A.A.F.) Sqn.—One night in May, 1943, this officer captained an aircraft detailed to attack Duisburg. When nearing the target area, the aircraft was subjected to anti-aircraft fire and severely damaged when a shell burst underneath the fuselage. Despite this, Sqn. Ldr. Thiele flew on to the target. Whilst making his bombing run, the aircraft was illuminated by the searchlights, but this captain maintained a straight course in order to ensure accurate bombing. Just as the bomb aimer had completed his work, the aircraft was repeatedly hit by fragments from bursting shells. One burst destroyed one of the engines, whilst shortly afterwards a second engine was disabled. The windscreens on the starboard side of the pilot's and the bomb aimer's cabins were shattered. Although he was dazed by a blow from a shell splinter, which struck him on the side of the head, Sqn. Ldr. Thiele skilfully extricated the damaged bombe. from a perilous situation and endeavoured to fly it to base. Shortly after crossing the English coast he was unable to maintain height, but, displaying superb airmanship he struggled on and succeeded in effecting a crash-landing at an airfield.

Act. Wing Cdr. G. W. HOLDEN, D.F.C., R.A.F.V.R., No. 102 Sqn.—One night in January, 1943, this officer captained an aircraft which attacked Lorient. On the outward flight severe icing conditions were encountered and one of the outer engines failed. The aircraft lost speed and height and was difficult to control. Despite this, Wing Cdr. Holden continued on his mission and bombed his target after flying over the area for some 20 minutes in order to ensure success.

Act. Flt. Lt. D. J. CURTIN, D.F.C., R.C.A.F., No. 106 Sqn.—Since the award of the D.F.C. this officer has participated in numerous operational sorties against heavily defended targets in the Ruhr and North Italy. During a daylight raid on Milan in October, when attacked by two enemy fighters, Flt. Lt. Curtin skilfully evaded them and enabled his gunners to destroy one and drive off the other. On two consecutive nights in January, 1943, he took part in attacks on Berlin; on the second occasion spending 50 minutes over the target to ensure accurate bombing.

Act. Sqn. Ldr. G. U. HILL, D.F.C., R.C.A.F., No. 111 Sqn.—This officer has led the squadron with great success and, since early April, 1943, has destroyed five enemy aircraft. Early in May, 1943, he led his formation in an operation off the Tunisian coast. During the flight a superior force of enemy fighters was engaged. In the ensuing combats, seven enemy aircraft were destroyed without loss, two of them by Sqn. Ldr. Hill.

Act. Sqn. Ldr. J. S. TAYLOR, R.A.F.V.R., No. 601 Sqn.—This officer's high qualities of leadership and efficiency have contributed materially to the high standard of operational efficiency of the squadron he commands. He has destroyed eleven enemy aircraft.

Act. Sqn. Ldr. E. W. WOOTTEN, D.F.C., No. 118 Sqn.—This officer, who has taken part in very many sorties, has led the squadron, and occasionally the wing, with great skill and dash. His fine example and outstanding devotion to duty have been inspiring.

Flt. Lt. R. A. NEWBERY, D.F.C., R.A.F.V.R., No. 118 Sqn.—This officer has completed a very large number of sorties. On one occasion he attacked an E-boat, setting it on fire; he has also destroyed an enemy aircraft.

Distinguished Flying Cross

Act. Wing Cdr. W. D. FERRIS, R.C.A.F., No. 408 (R.C.A.F.) Sqn.—This officer has undertaken numerous sorties, including attacks on such heavily defended areas as Emden, Berlin, Essen, Cologne and others. On one occasion, with Stettin as the objective, locomotives and searchlight positions were machine-gunned in the course of the flight. On two occasions his aircraft has been illuminated by searchlights whilst over the target, but, in spite of this, Wing Cdr. Ferris executed successful attacks.

P/O. W. H. HOPKINS, R.A.F.V.R., No 103 Sqn.—As bomb aimer during numerous operational sorties, P/O. Hopkins has invariably exhibited keenness and determination to achieve success. On one occasion in January, 1943, undeterred by the pain from a wound in the eye, sustained when the perspex in his turret was shattered by anti-aircraft fire, he remained at his post and made a successful attack on Essen. On another occasion, while attacking Turin, P/O. Hopkins replaced the mid-upper gunner, who became ill, and enabled his captain to complete the mission.

P/O. R. E. G. HUTCHISON, R.A.F.V.R., No. 106 Sqn.—This officer has flown on numerous operational sorties, including attacks on the majority of the enemy's most heavily defended targets; he also participated in daylight raids on Danzig, Le Creusot and Milan. One night in January, 1943, he was detailed to attack Berlin. On the outward journey the electrical circuits in the mid-upper turret of his aircraft failed. With skill and determination P/O. Hutchison repaired the defect, although owing to the intense cold he was nearly unconscious by the time the repair was finished.

Flt. Lt. T. D. MISSELBROOK, No. 101 Sqn.—One night in January, 1943, Flt. Lt. Misselbrook and Sgt. Harrison were captain and rear gunner respectively of an aircraft which was attacked by an enemy fighter when near the N.W. coast of Germany. By skilfully out-manœuvring the attacker, Flt. Lt. Misselbrook enabled his rear gunner to shoot it down from close range. Although his aircraft sustained much damage and one of its engines failed, Flt. Lt. Misselbrook flew the aircraft back to this country and landed it safely. On a previous occasion he flew his damaged aircraft back to base in most trying circumstances.

Act. Flt. Lt. J. R. TUCKWELL, R.A.F.V.R., No. 101 Sqn.—This officer throughout his second tour of operational duty has displayed a praiseworthy consistency in penetrating the enemy's defences and pressing home his attacks with outstanding determination. His sorties include attacks against some of the most heavily defended enemy targets.

Act. Flt. Lt. J. S. WALKER, R.A.F.V.R., No. 44 Sqn.—This officer has taken part in a large number of operational sorties, many of which have been against the enemy's most heavily defended targets. On all occasions Flt. Lt. Walker has displayed the utmost determination in locating and bombing his target, and he has obtained some excellent photographs.

Act. Flt. Lt. K. T. WATSON, R.A.F.V.R., No. 78 Sqn.—This officer has completed a very successful tour of operational duties in the course of which he has attacked many of the most heavily defended areas in Germany, including Essen, Cologne and Mannheim. Early in his operational career, just after taking off with a heavy bomb load, his port inner engine caught fire. Displaying outstanding courage and coolness, Flt. Lt. Watson manœuvred his aircraft back to the coast and safely ditched it off shore, thus extricating himself and his crew from a hazardous situation with the least possible damage.

Act. Flt. Lt. L. E. W. WEBB, D.F.M., R.A.F.V.R., No. 21 Sqn.—Since the award of the D.F.M., this officer has completed many excellent sorties as navigator. He took part with good effect in an attack on Eindhoven, and as leading navigator, in many formation sorties.

Act. Flt. Lt. H. A. WINFIELD, R.A.F.V.R., No. 7 Sqn.—This officer has completed many operational sorties. By his courage and determination in the face of the enemy, combined with his remarkably accurate navigation, Flt. Lt. Winfield has been largely responsible for many of the successes achieved.

Act. Flt. Lt. H. B. TURNBULL, R.C.A.F., No. 148 Sqn.—Flt. Lt. Turnbull has completed a large number of operational sorties. A meticulous and determined officer, he has obtained many successful hits on enemy land targets and amongst shipping. On one occasion he started three fires during one night.

SERVICE AVIATION

Kasserine Pass

F/O. R. L. W BAELZ, R.A.F.V.R., No. 614 Sqn.—F/O. Baels has completed 24 sorties in North Africa. One night in February, 1943, he was detailed for an attack on the Kasserine Pass in very adverse weather. Despite the presence of low clouds obscuring the tops of the hills, this officer successfully completed his mission.

F/O. C. A. H. BECK, R.A.F.V.R., No. 13 Sqn.—On one occasion this officer successfully bombed Bizerta docks from 1,000 feet, while his gunner silenced a gun post and extinguished a searchlight. More recently he has successfully attacked enemy airfields from the same height in the face of intense opposition.

F/O. J. C. COGILL, R.A.F.V.R., No. 142 Sqn.—F/O. Cogill has completed 28 sorties, and since arriving in North-West Africa has been employed as squadron signal's officer.

F/O. A. L. CRAIG, R.N.Z.A.F., No. 46 Sqn.—F/O. Craig has been employed as navigator/wireless operator on operational sorties and coastal patrols. At all times has has displayed courage and great devotion to duty.

F/O. C. A. CROMBIE, D.S.O., R.A.A.F., No. 89 Sqn.—F/O. Crombie has participated in intruder patrols and made low-level attacks on enemy bases. He has personally destroyed four enemy aircraft in air combat.

F/O. H. EVANS, R.A.F.V.R., No. 461 (R.A.A.F.) Sqn.—This officer has exhibited exceptional ability as look-out when searching for enemy aircraft and submarines. He has also been successful in instructing members of other air crews in these duties. On one occasion when his aircraft was attacked by three Arados 196, he shot down one and severely damaged another. The third broke off the attack.

F/O. D. C. FLEMING-WILLIAMS, R.A.F.V.R., No. 120 Sqn.—This officer has participated in many operational sorties. In February, 1943, he was captain of an aircraft detailed for convoy escort duty, when a U-boat was sighted. F/O. Fleming-Williams immediately made a most determined attack on the submarine.

F/O. D. M. GRANT, R.C.A.F., No. 400 (R.C.A.F.) Sqn.—F/O. Grant has taken part in many operational sorties during which he has personally destroyed one enemy aircraft and damaged eighteen locomotives.

F/O. W. A. GREGORY, R.A.F.V.R., No. 23 Sqn.—As navigator this officer has participated in many successful intruder patrols over Sicily and Italy, damaging a large number of enemy trains, transport and ground targets. One night in July, 1942, he successfully navigated his aircraft through very bad weather to Chartres and Evreux, where two enemy aircraft were destroyed. A month later F/O. Gregory directed his pilot safely to base through adverse weather, although the compass, radio and aircraft lighting had failed.

F/O. E. J. HENLY, R.A.F.V.R., No. 142 Sqn.—This officer has participated in numerous operational sorties as bomb aimer. Invariably he shows great determination, only releasing his bombs when certain of the correct aiming point, even though this has necessitated several runs over the target area.

F/O. J. C. HUTSON, R.A.F.V.R., No. 680 Sqn.—Prior to the attack on El Alamein, F/O. Hutson showed great courage in photographing enemy front line positions. On several occasions he was driven from his target by enemy fighters, but always with great determination returned and completed his tasks.

F/O. D. J. MCBRIEN, R.A.F.V.R., No. 276 Sqn.—F/O. McBrien has participated in a large number of air sea rescue searches, during which he has rescued eight members of air crew from the sea.

F/O. G. R. MATHEW, R.A.F.V.R., No. 48 Sqn.—F/O. Mayhew has taken part in numerous operational flights. He and his crew have given evidence of excellent team work, having made three attacks on submarines, one of which was probably sunk.

F/O. A. R. NEILSON, R.C.A.F., No. 59 Sqn.—This officer has flown on operations since May, 1942, when he made a daylight attack on an enemy convoy off the Dutch coast. Later he participated in the "1,000"-bomber raid on Bremen. Another time, F/O. Neilson, in the face of intense opposition, made a successful attack on an enemy merchant vessel. More recently he has done excellent work on long-range anti-submarine patrols.

F/O. C. M. RAMSEY, R.A.F.V.R., No. 153 Sqn.—An efficient and keen night fighter pilot, F/O. Ramsey has taken part in many sorties and patrols. One night in March, 1943, while on patrol, the starboard engine of this officer's aircraft failed, causing the aircraft at times to become uncontrollable. Although unable to see his instruments, due to vibration, F/O. Ramsey displayed great skill and determination and flew the aircraft for 60 miles before landing safely at an airfield.

F/O. J. R. RIDING, R.A.F.V.R., No. 179 Sqn.—F/O. Riding has completed numerous operational sorties. He is employed in the complicated and dangerous work of searching for, and attacking, U-boats at night. His crew recently made four promising attacks on submarines.

F/O. P. C. W. SAGE, R.A.F.V.R., No. 46 Sqn.—Previous to joining this squadron F/O. Sage completed a tour of operational duty on coastal fighter work, during which he participated in convoy patrols and night attacks on targets in Cyrenaica and Sicily, destroying one enemy aircraft. More recently he has fought in four air combats, all of which have been brought to a successful conclusion. Altogether F/O. Sage has destroyed four enemy aircraft by night.

F/O. D. G. SHEPPARD, R.A.F.V.R., No. 277 Sqn.—This officer took part in the first Air/Sea Rescue sortie. In January, 1943, F/O. Sheppard participated in the rescue of a crew of a Defiant

A GOOD TEAM: The pilots, ground crews and some of the aircraft of a Typhoon bomber squadron. It is commanded by Sqn. Ldr. Dennis Crowley-Milling, D.F.C. and Bar.

SERVICE AVIATION

under conditions of extreme difficulty in a very rough sea.

F/O. K. G. SPIERS.—F/O. Spiers took part in operational sorties in France, and since then has participated in many operations against targets in Tunisia, including low level attacks on enemy transport.

F/O. A. C. WATSON, R.A.F.V.R., No. 40 Sqn.—This officer has completed a large number of operations against targets in Crete, Libya, Tunisia, Sicily and Tripolitania. He has been engaged on both bombing sorties and reconnaissances, achieving on one occasion the destruction of a number of enemy dispersed aircraft.

Over Bochum

Wing Cdr. R. V. MCINTYRE, No. 100 Sqn.—One night in May, 1943, Wing Cdr. McIntyre and Flt. Sgt. Renno were captain and wireless operator/air gunner of an aircraft detailed to attack Bochum. When nearing the target area the aircraft was hit by anti-aircraft fire. Two engines were put out of action, while other equipment was damaged. Despite this, Wing Cdr. McIntyre continued to the target and bombed it. Not until the task was accomplished did Flt. Sgt. Renno inform his captain that he had been wounded in the stomach and thigh. Although the aircraft was difficult to control, Wing Cdr. McIntyre skilfully flew the aircraft back to this country on two engines and effected a crash-landing at an airfield. Despite his injuries, Flt. Sgt. Renno worked his wireless apparatus on the return flight, obtaining bearings which were of great assistance.

P/O. R. M. MCCAWLEY, R.A.A.F., No. 40 Sqn.—One night in October, 1942, P/O. McCawley was a member of a crew of a Wellington aircraft which was lost during a very bad storm. By his outstanding technical skill and determination this officer was largely responsible for the safe return of the bomber, which had almost reached the limits of its fuel endurance. On many other occasions P/O. McCawley's cool courage and excellent commentaries have saved his aircraft from possible destruction.

P/O. A. MCLEOD, No. 540 Sqn.—P/O. McLeod has participated in a large number of operational sorties, the majority of which have been over heavily defended areas.

P/O. C. C. STOREY, R.A.A.F., No. 455 (R.A.A.F.) Sqn.—This pilot completed a number of operational sorties with Bomber Command before joining this Squadron. In these he was exceptionally successful, and bombed targets which included Hamburg and Cologne. He has since completed a number of missions in torpedo carrying aircraft and a bombing attack on the barracks at Christiansund, which was achieved with precision and great success. He has also taken part in many offensive sweeps against enemy shipping, during which success has been attained in spite of heavy opposition and adverse weather.

P/O. G. W. YOUNG, R.C.A.F., No. 90 Sqn.—P/O. Young and Sgt. Davine were pilot and rear gunner respectively of an aircraft detailed to attack a target in the Ruhr one night in May, 1943. During the operation the aircraft was attacked by an enemy fighter. Sgt. Davine was wounded in both legs, while his turret was put out of action. Although in great pain he continued to give his pilot a commentary on the attacker's movements. The fighter made repeated attacks but, displaying great skill, P/O. Young eventually evaded it. His aircraft was badly damaged and became difficult to control. Despite this P/O. Young flew it to base and made a safe landing.

Conspicuous Gallantry Medal (Flying)

Sgt. T. P. PETRIE, No. 70 Sqn.—One night in April, 1943, this airman was the pilot and captain of an aircraft detailed to attack an enemy landing ground. In the run up the aircraft was hit by anti-aircraft fire, but Sgt. Petrie held course and a stick of bombs was released. Almost immediately the aircraft was again hit, which caused it to dive steeply. Sgt. Petrie was severely wounded, his foot being practically severed, while other members of the crew were slightly wounded. Despite his injuries, Sgt. Petrie skilfully regained control of his aircraft, circled and released the remaining bombs over the target area. Course having been set for home, the injured pilot was removed from his seat and given first aid, while another member of the crew kept the aircraft on its course to base. When the airfield was reached, Sgt. Petrie who, throughout the return flight, though in considerable pain and faint through loss of blood, had remained in command as captain, gave the crew permission to leave by parachute. They elected to remain, however, confident in his ability to effect a landing. By strapping him in the pilot's seat and tying his uninjured foot to the rudder bar, Sgt. Petrie was able to take over the controls. When approaching land, at a height of 300ft., the petrol supply ran out, but a successful crash-landing was made.

Sgt. A. F. BLACKWELL, No. 500 Sqn.—In April, 1943, at night, these airmen were navigator and wireless operator/air gunner respectively of an aircraft the pilot of which was killed by anti-aircraft gunfire. Displaying great promptitude and resource, Flt. Sgt. Kempster pulled back the control column, while other members of the crew were removing the pilot from his seat, and succeeded in regaining height. His immediate action undoubtedly saved the aircraft from crashing. Sgt. Blackwell then took over the controls and flew the aircraft to base where the remaining members of the crew were enabled to leave the aircraft by parachute. All landed safely.

LAIRDS OF LAMPEDUSA: The Swordfish crew who forced-landed on the island because of fuel shortage. On landing they saw white flags waved and received the Italian surrender. (Left) Sgt. Wright; (Centre) Sgt. Cohen; (Right) Sgt. Tait. Behind is Air Marshal Sir Arthur Coningham who congratulated them.

Bar to Distinguished Flying Medal

Sgt. D. L. PERRY, D.F.M., No. 35 Sqn.—The skill and courage of this wireless operator/air gunner have contributed largely to the successes achieved by his crew. He has taken part in five raids on Hamburg.

Distinguished Flying Medal

Sgt. A. HARRISON, No. 101 Sqn.—For citation see Flt. Lt. Misselbrook, D.F.C.

Sgt. W. DAVINE, No. 90 Sqn.—For citation see P/O. Young, D.F.C.

Flt. Sgt. J. D. W. RENNO, R.A.A.F., No. 100 Sqn.—For citation see Wing Cdr. MCINTYRE, D.F.C.

Flt. Sgt. A. S. KEMPSTER, No. 500 Sqn.—For citation see Sgt. Blackwell, C.G.M.

Sgt. K. H. BERRY, No. 103 Sqn.—This airman has completed many operational missions and has invariably pressed home his attacks with great determination. On one occasion when attacking Kiel, his aircraft was hit and damaged by anti-aircraft fire. Despite this, Sgt. Berry displayed great persistence and bombed his objective successfully. On another occasion he displayed commendable skill and initiative during a flight to Turin. In a recent attack on Essen, Sgt. Berry pressed home his attack with great spirit, although his aircraft was damaged by opposing fire.

Flt. Sgt. R. E. MACFARLANE, R.C.A.F., No. 101 Sqn.—One night in January, 1943, Flt. Sgt. MacFarlane was captain of an aircraft which was attacked by three Ju 88s when returning from an operational sortie. The mid-upper gunner was killed, the rear gunner severely wounded and the aircraft was badly damaged. Flt. Sgt. MacFarlane took violent evasive action and succeeded in shaking off the enemy aircraft. Shortly afterwards the bomber was held by searchlights and engaged by intense anti-aircraft fire and height was lost down to 4,000 feet in avoiding further damage. Soon afterwards a formation of five hostile fighters was sighted, but when they attempted to attack Flt. Sgt MacFarlane skilfully evaded them.

Sgt. E. PARRY and Sgt. R. S. GREEP, both of No. 106 Sqn.—On the night of January 17th, 1943. Sgts. Parry and Greep were the mid-upper and rear gunners respectively of an aircraft which was detailed to bomb a target in Berlin. On the return journey, whilst still over enemy territory, the aircraft was attacked by an enemy fighter from close range. Sgts. Parry and Greep, coolly withheld their fire until the range was shortened and then delivered accurate bursts which caused the fighter to break away. In a second attack, Sgt. Parry's concise commentary enabled the pilot to obtain a favourable position from which both gunners could deliver effective fire. The enemy aircraft was set alight and fell to the ground. Later, the bomber was held in a cone of searchlights and subjected to a barrage of light anti-aircraft fire. Sgts. Parry and Greep, with well-aimed bursts, extinguished several of the searchlights.

Flt. Sgt. R. G. THACKERAY, No. 40 Sqn.—This airman has participated in operations against targets in Libya, Crete, Tunisia, Sicily and Tripoli. On each sortie, he has behaved with cool determination, continuing his search for the target until satisfied that the correct objective had been reached. On one occasion, when attacking Tunis and La Goulette, his first stick of bombs fell near the power station at La Goulette. Subsequently, he found two large ships in the entrance of the canal. These were bombed accurately and set on fire.

Sgt. N. L. CHILD, No. 142 Sqn.—In August, 1942, while attacking Kassel, the aircraft in which Sgt. Child was engaged as wireless operator was illuminated by searchlights and damaged by anti-aircraft fire. By his skill, Sgt. Child was largely responsible for the safe return of the aircraft to base in harassing circumstances.

Sgt. C. G. COOK, No. 142 Sqn.—Sgt. Cook has served with this squadron since October, 1942. He has, at all times, displayed skill and determination in the handling of his aircraft and crew, and has consistently pressed home his attacks in the face of the heaviest opposition.

Sgt. G. S. DAVENPORT, No. 142 Sqn.—In October, 1942, his crew was detailed to fly in a daylight raid on Essen. Despite the fact that cloud cover was scanty, they continued, bombed the target successfully, and returned safely to base. He has often secured valuable photographs.

Sgt. F. C. COMPTON, No. 10 Sqn.—One night in May, 1943, this airman was the rear gunner of an aircraft detailed to attack Duisburg. During the operation his aircraft was attacked and damaged by an enemy fighter. Sgt. Compton resolutely returned fire and, following an accurate burst, the enemy aircraft stalled and then fell towards the ground, disappearing out of sight through the clouds. Half an hour later the bomber was again attacked by enemy fighters. In the ensuing action Sgt. Compton coolly and skilfully used his guns, while giving his captain directions which enabled him to evade the attackers. The following night during an operation against Bochum his aircraft, which had been damaged by anti-aircraft fire, was attacked by two enemy aircraft. Displaying great skill and determination, Sgt. Compton shot one of them down. Although his guns were rendered useless, he gave his captain a commentary which enabled him to evade the remaining fighter.

Sgt. A. D. FINLAYSON, R.A.A.F., No. 199 Sqn.—One night in May, 1943, this airman was the rear gunner of an aircraft detailed to attack Dortmund. On the return flight, the aircraft was attacked by an enemy fighter. Sgt. Finlayson coolly withheld his fire until the attacker came into close range and then, with a well-directed burst, shot the enemy aircraft down.

Roll of Honour

Casualty Communiqué No. 253.

THE Air Ministry regrets to announce the following casualties on various dates. The next of kin have been informed. Casualties "in action" are due to flying operations against the enemy; "on active service" includes ground casualties due to enemy action, non-operational flying casualties, fatal accidents and natural deaths.

Of the names in this list 103 are second entries giving late information of casualties published in earlier lists.

Royal Air Force

KILLED IN ACTION.—F/O. K. W. Johnson; F/O. C. M. McClure; Sgt. T. J. McMahon; Sgt. G. W Quale; Sgt G. Scully.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—Flt. Sgt E. G. Bound; Sgt. F. Briggs;

Sgt. E. F. Cronk; Sgt. A. C. Jukes; Flt. Sgt. A. R. Lane; Sgt. W. S Mason; F/O. D. P. Munns.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Sgt. R. J. Bebbington; Flt. Sgt. D. A. Boldy; Sgt. E. Bradley; Sgt. A. Buckley; Sgt. R. W. Butler; F/O. J. A. Caldwell; Sgt. J. Colville; Sgt. S. Coop; Sgt. E. Cox; Sgt. W. H. Creed; Flt. Sgt. A. P. Cullerne; Sgt. D J. Curling; Sgt. P. B. Dauncey; P/O. A. G. Day; Flt. Sgt. G. H. Duke; Sgt. A. S. C. Ellis; Sgt. D. Evans; Sgt. G. Ewen; Sgt. J. A. Fleming; Sgt. R. Forgie; Sgt. D. Freeman; Sgt. F. A. Frost; F/O. T. A. Gabe; Sgt. W. C. P. Harfoot; Flt. Sgt. K. H. Hart; Flt. Sgt. G. A. K. Hunter; Sgt. E. Knight; P/O. R. W. Komiski; Sgt. M. D. Lawlor; Sgt. S. Lloyd; F/O. P. H. Looker; Sgt. J. W. Morton; P/O. D. B. Murdock; Flt. Sgt. A. J. Neil; Sgt. W. E. Overend; Flt. Lt. G. N. Parker; P/O. G. H. Quinn; Sgt. D. A. Redler; Sgt. F. Routledge; Sgt. W. McP. Samuel; Sgt. F. A. Scotland; Sgt. R. H. C. Seymour; P/O. K. J. Shirley; Sgt. F. Skelley; Sgt. H. A. Storey; Flt. Sgt. H. S. Tadman; Sgt. A. Thomas; Sgt. H. Thomas; Sgt. R. Turley; Flt. Sgt. D. W. Wallis; Flt. Lt. D. W. Whiteman; Flt. Sgt. J. C. Wilkinson.

WOUNDED OR INJURED IN ACTION.—Flt. Lt. E. R. Baker, D.F.C.; Sgt. G. W. Goodfellow; Sgt. G. D. McM. Owen.

DIED OF WOUNDS OR INJURIES RECEIVED IN ACTION.—Sgt. D. C. H. Baker.

MISSING.—Sgt. C. Abbott; Sgt. A. J. Adams; Sgt. J. Avery; Sgt. R. D Balfour; Sgt. J. Banyer; Sgt. B. K. Barry; Sgt. D. W. E. Batch; Sgt. H. Beck; Sgt. J. Bilton; Sgt. C. H. G. Boxall; Sgt. C. Brennan; Sgt. B. A. Bunting; Sgt. D. Church; Sgt. H. Clegg; F/O. J. S. Connors; Sgt. R. W. Connel; Sgt. R. N. Dixon; Sgt. P. E. C. Flood; Sgt. J. Flux; Sgt. W. Foley; Sgt. J. T. Glendinning; F/O. S. W. Gould; P/O. G. H. F. G. Gregory, D.F.M.; P/O. D. V. Hamer; Sgt. J. McG. Hargreaves; Sgt. F. G. Harris; Flt. Sgt. A. Hartley; Sgt. H. P. Holme; Sgt. J. B. J. Hook; Flt. Lt. J. V. Hopgood, D.F.C.; Sgt. J. R. Hough; Sgt. T. W. Hunt; Sgt. P. F. Jackson; Sgt. W. Jennings; Sgt. J. Jones; Sgt E. F. Kinerman; Sgt. C. L. King; Sgt. J. R. Lecomber; Sgt. G. Lennox; P/O. K. Madin; Sgt. C. A. Margerum; F/O. R. B. Martin; Sgt. W. J. Merrigan; Sgt. J. W. Minchin; Sgt. K. Oatridge; Sgt. D. J. Park; Sgt. L. H. Pattison; Sgt. A. J. Phillips; Sgt. G. Phillips; Sgt. C. H. Rawlins; Sgt. J. W. G. Reeve; Sgt. A. S. Renshaw; Sgt. G. Sandfield; Sgt. C. V. Scadden; Sgt. L. T. Scarle; Sgt. P. V. Sharman; Sgt. D. S. Sidhu; Sgt. D. C. Smith; Flt. Sgt. L. M. Smith; P/O. D. Spooner; Sgt. J. R. Stone; Sgt. J. W. Stotter; Sgt. H. Stripp; F/O. D. H. Thomas; Sgt. E. W. Thomson; Sgt. W. J. Turpin; Sgt. J. J. Veldsman; F/O. L. W. Vinden; Sgt. T. A. Wells; Sgt. H. R. Williamson; Sgt. W. A. Willis; Sgt. F. A. Worsnop; F/O. J. R. Worswick.

MISSING, BELIEVED KILLED ON ACTIVE SERVICE.—Sgt. R. E. Allen; P/O. P. C. S. Bird; P/O. T. Booth; Sgt. J. A. Scott; P/O. A. Smith.

KILLED ON ACTIVE SERVICE.—Sgt. F. Barber; Sgt. K. H. Bateman; L.A/C. K. Bradley; Sgt. W. T. Bryant; Sgt. E. J. Buckland; L.A/C. D. Campbell; L.A/C. H. C. Carter; P/O. T. B. Curry; F/O. P. E. Davison; Sgt. E. Grisenthwaite; Sgt. F. Harrold; Sgt. R. P. Lansdale; W/O. F. J. McDaniel; P/O. L. C. Martin; Sgt. D. T. Monk; F/O. J. S. Moore; L.A/C. J. C. Noble; Sgt. J. R. Parkes; Sgt. D. Richardson; L.A/C. J. S. Robb; Sgt. D. J Rolfe; L.A/C. R. Smythe; Sgt. J. P. Stallard; Sgt. A. B. Standen; Sgt. E. N. Sykes; Sgt. W. A. Tait; Sgt. G. Taylor; L.A/C. K. Taylor; Sgt. R. Whitlam.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED ON ACTIVE SERVICE, NOW PRESUMED KILLED ON ACTIVE SERVICE.—Sgt. J. V. Glansfield; Act. Wing Cdr. R. O. M. Graham, D.F.C.; P/O. A. D. C. Jenkins; Flt. Sgt. W. Kelly; Sgt. E. E. Lacs; Sqn. Ldr. J. A. H. Parker; A/C.1 P. C. Rose; W/O. A. E. Turley.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED ON ACTIVE SERVICE.—Sgt. H. R. Fidgin.

WOUNDED OR INJURED ON ACTIVE SERVICE.—L.A/C. J. Davies; Sgt. B. C. Fleming; Act. Sgt. M. McL. Gallienne; Sgt. R. E. Jones; Sgt. I. McCallum.

DIED OF WOUNDS OR INJURIES RECEIVED ON ACTIVE SERVICE.—Sgt. R. L. Harris.

DIED ON ACTIVE SERVICE.—A/C.2 H. Bentley; Sgt. H. E. Boyd; W/O. R. G. H. Catherall; L.A/C. P. A. G. Cock; Sqn. Ldr. E. C. Corke; Flt. Lt. J. K. Denham; L.A/C. C. H. Fish; Flt. Lt. J. E. Garland; Cpl. R. F. Hamilton; L.A/C. L. J. Jarvis; L.A/C. J. G. McKune; L.A/C. J. G. Olin; L.A/C. E. G. William.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER OF WAR.—Wing Cdr. P. H. Bragg; Flt. Sgt. G. Viles.

Royal Australian Air Force

KILLED IN ACTION.—F/O. D. T. Archibald, D.F.C.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Sgt. R. C. Allan; Sgt. G. J. Bailey; Sgt. A. R. C. Bates; Flt. Sgt. R. D. Beeston; Sgt. J. Boyle; Sgt. R. H. D. Calder; Sgt. J. H. Caldwell; Flt. Sgt. I. C. Dunn; Sgt. N. C. Hain; F/O. D. P. Leigo; Sgt. F. L. McIntyre; Sgt. K. H. Shoesmith.

MISSING.—Flt. Sgt. J. L. Barry; P/O. A. F. Burcher; Flt. Sgt. E. J. Candish; Sgt. G. A. Downton; Flt. Sgt. A. Hilton; Flt. Sgt. D. N. Jaekel; Sgt. F. G. Latham; P/O. S. M. Russ; F/O. D. M. Tassie; Sgt. J. M. Williams; Flt. Sgt. W. Williams.

KILLED ON ACTIVE SERVICE.—Flt. Sgt. P. W. A. Armstrong; Sgt. W. W. Kirby; P/O. H. L. Maddison.

Royal Canadian Air Force

KILLED IN ACTION.—Sgt. V. L. Boyd.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—P/O. D. G. Burlingam; Sgt. A. F. Christie.

Marshal of the Royal Air Force, Lord Trenchard, being introduced to the pilots of a squadron in Algeria. Group Capt. Strugnell who commands the station is on the left.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Sgt. J. D. O'L. Cooney; P/O. G. V. Desourdy; Flt. Sgt. R. W. Hood; W/O. W. E. Lunan; Sgt. S. H. Lupton; Sgt. W. G. McKinnon; P/O. E. McG. Palmer.

MISSING, BELIEVED KILLED IN ACTION.—P/O. J. A. Dalton; P/O. L. M. Clark; Sgt. D. E. Giles; Sgt. H. A. MacEachen.

MISSING.—Sgt. G. H. Dunn; F/O. R. Earnshaw; F/O. W. G. Elliott; Sgt. J. A. Farrel; Flt. Sgt. J. W. Fraser; P/O. E. E. Kennedy; Sgt. J. G. Grainger; P/O. W. Holden; Sgt. J. W. McIntosh; P/O. G. O. MacKay; Sgt. G. D. Menzies; P/O. H. M. Metcalfe; Act. W/O. R. B. Moulton; Sgt. M. H. Nesbitt; Flt. Sgt. J. A. Ramsay; Sgt. J. E. A. Thibaudeau; Sgt. J. White.

KILLED ON ACTIVE SERVICE.—Sgt. J. E. L. Burgess; P/O. J. Cherkinsky; Sgt. A. A. F. Hall; Sgt. R. K. Holmes; Sgt. F. R. Santo.

WOUNDED OR INJURED ON ACTIVE SERVICE.—Sgt. G. E. Foster.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER OF WAR.—F/O. G. P. Wilson.

Royal New Zealand Air Force

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—F/O. R. H. Suckling.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—P/O. J. R. Farrow; F/O. J. B. Monro.

MISSING.—Sgt. W. L. F. Brian; Sgt. R. C. Buckley; Sgt. K. Halliburton; Sgt. A. C. Howell; Sgt. E. T. Hunter; Sgt. E. R. Jenkins; Sgt. D. R. Ross; Sgt. M. E. J. Shogren; P/O. J. H. Stowell; P/O. D. L. Thompson.

KILLED ON ACTIVE SERVICE.—Sgt. F. Hulton; Sgt. J. L. McDonald; P/O. L. W. Sanders.

WOUNDED OR INJURED ON ACTIVE SERVICE.—Sgt. L. P. Patterson.

South African Air Force

MISSING.—Lt. H. G. Ballard.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED ON ACTIVE SERVICE.—Air Sgt. J. A. W. Geyer; Lt. F. J. Rusk; 2/Lt. J. Tzaitzis.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER OF WAR.—Lt. A. B. Groch.

Indian Air Force

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED ON ACTIVE SERVICE, NOW PRESUMED KILLED ON ACTIVE SERVICE.—P/O. Nasirudin; P/O. G. Sequiera.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED ON ACTIVE SERVICE.—P/O. Lakshman Saru; P/O. Mousinho Nsiloq Francis.

Casualty Communiqué No. 254

Of the names in this list 102 are second entries giving later information of casualties published in earlier lists.

Royal Air Force

KILLED IN ACTION.—P/O. J. D. Aitchison; Sgt. R. Allison; Sgt. R. W. J. Bickell; Sgt. M. T. Dilworth; Sgt. D. V. Edye; P/O. F. R. Ford; F/O. J. A. Henderson; W/O. P. F. Laver; Flt. Lt. G. L. Macintyre, D.F.C.; Sgt. H. Mason; F/O. S. D. Murray; A/C.1 H. J. A. Newton; Sgt. W. Oldroyd; Sgt. R. J. Pike; Sgt. G. T. Powell; Sgt. A. Reilly; Sgt. J. H. Stretton; Sgt. E. J. Wilson; Sgt. M. Worsley.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—F/O. J. A. Edwards; Flt. Sgt. J. R. Hughes; Flt. Sgt. R. S. S. James; Sgt. E. Lewis; Sgt. W. S. Rendall; P/O. B. S. Robertson; Flt. Lt. G. B. Smyth; P/O. J. D. Turner; Sgt D. B. Williams.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—W/O. W. R. Allison; Act. Sqn. Ldr. N. Anderson; Sgt. O. P. Beswick; Sgt. S. Brau; P/O. K. J. Broderick; Sgt. A. D. Collins; P/O. A. C. Comfort; P/O. F. A. Creighton; Sgt. I. Duncan; Sgt. T. W. B. Emmett; Sgt. R. T. Fage; Flt. Lt. S. R. Fairbairne-McPhee; Sgt. R. Farmer; F/O. J. Fortune; Flt. Sgt. T. Frearson; Sgt. A. C. Gasson; Sgt. A. J. Hamlyn; Flt. Sgt. N. R. Hartley; Flt. Sgt. R. Holden; Sgt. A. Jones; Sgt. R. H. Kelly; Sgt. J. S. Leather; Sgt. R. J. Liversauch; P/O. E. F. Lloyd; Sgt. O. F. Lodge; P/O. V. Lowson; F/O. J. E. Makgill; Sgt. W. Matheson; Sgt. C. T. R. Matthewman; Sgt. G. C. Morffew; Sgt. S. A. Morison; Sgt. J. McK. D. Oliver; Flt. Lt. W. B. Orr; Sgt. R. C. Perriam; Sgt. W. L. S. Rees; P/O. B. A. C. Richards; Sgt. S. A. Roberts; Sgt. J. G. S. Rocks; Sgt. A. B. Scanlan; Sgt. D. T. Stanners; Sgt. J. N. Waddington; Flt. Sgt. J. R. Williams; Sgt. R. G. Williams; P/O. F. H. Wood.

WOUNDED OR INJURED IN ACTION.—Sgt. R. Gibson; Sgt. S. L. Granville; Sgt. L. C. Hodgson; Sgt. K. J. P. McFarlane; F/O. J. More.

MISSING, BELIEVED KILLED IN ACTION.—Flt. Lt. H. P. Atkinson; Sgt. B. I. Curnuck; Flt. Sgt. J. O. W. Foster; Sgt. L. Gill; Flt. Sgt. K. Hall; Sgt. J. S. Harris; Sgt. R. Martin; Act. Flt. Lt. J. W. Potts; Sgt. G. C. Whittaker; Sgt. W. Woodland.

MISSING.—Sgt. S. Abel; P/O. N. Ainsworth; Sgt. A. V. Ansell; Flt. Lt. R. H. Ashton; L.A/C. R. E. Baker; Sgt. A. L. Barber; Sgt. K. T. Bates; P/O. C. J. Bickham; Act. Wing Cdr. H. P. Blatchford, D.F.C.; Flt. Lt. I. N. Bonard; Sgt A. W. Bond; Sgt. G. Brick; Sgt. D. Brown; L.A/C. G. I. Buckman; F/O. J. J. W. Burns; Sgt. E. G. Buscombe; Sgt. A. R. Camburn; Sgt. F. J. Chandler; Sgt. W. J. Clotham; P/O. C. Coleman; Sgt. W. Collier; Sgt. I. D. Crawford; Sgt. E. J. Culley; P/O. R. A. Curtis; Sgt. W. J. Ouseby; W/O. M. De Beauchamp-Collenette, D.F.M.; Sgt. W. R. East; Sgt. G. Eastwood; Sgt. N. A. Fearneyhough; Sgt. H. G. Fletcher; P/O. J. I. P. Ford; Sgt. K. F. Garnett; Sgt. M. A. Gibson; Sgt. A. Goodhand; Sgt. M. J. Grace; Sgt. A. Graham; Sgt. L. Hannam; Sgt. C. M. Harrower; Sgt. R. E. Hawkins; Sgt. A. Hawley; Sgt. J. N. Hendry; Sgt. J. Hodgson; Sgt. J. R. Hunter; Sgt. T. T. Jardine; Flt. Sgt. K. D. Jones; Sgt. P. Lees; Sgt. W. S. Lees; Sgt. W. H. Louth; Sgt. G. Lyle; Sgt. J. Mackintosh; Sgt. J. K. Mansley; F/O. G. Meakins; Sgt. F. A. Mouton; Sgt. T. E. Musto; Sgt. W. Nicholson; P/O V. A. Nono; Sgt. J. Norman; Sgt. F. Norris; Sgt. W. Nugent; P/O. R. A. Parkinson; P/O. S. Plaskett; Flt. Sgt. F. Poore; P/O. A. R. Potter; R. D. Roberts; Sgt. D. W. Rowley; Sgt. M. Savage; P/O. A. R. Schofield; Flt. Sgt. D. Sheldon; Sgt. R. Shepherd; Sgt. B. W. Squires; F/O. J. L. Taylor; Sgt. C. D. Todd; P/O. A. A. Toller; P/O. M. Tuckwell; F/O. H. K. Wainer; Sgt. G. Watson; Sgt. J. H. Whitehart; Sgt. E. H. Wood.

MISSING, BELIEVED KILLED ON ACTIVE SERVICE.—Flt. Lt. E. W. Bitmead, D.F.C.

KILLED ON ACTIVE SERVICE.—F/O. T. G. Bridges; F/O. D. Chalmers; Sgt. J. A. Cheetham; Sgt. H. J. Cox; Sgt. L. R. Crouch; Sgt. J. H. L. Edwards; Sgt. J. S. Grocock; Sgt. T. N. Harker; Sgt. S. P. James; Sgt. E. Mitchell; L.A/C. S. O. Nethercot; P/O. R. H. Nicholls; Sgt. J. R. Richmond; Sgt. E. D. Scott; Flt. Sgt. B. S. Symes; P/O. W. H. Tutt

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED ON ACTIVE SERVICE.—P/O. C. N. Maynard.

WOUNDED OR INJURED ON ACTIVE SERVICE.—Sgt. R. J. Bird; Sgt. W. H. MacL. Ironside; Sgt. R. A. Major.

DIED OF WOUNDS OR INJURIES RECEIVED ON ACTIVE SERVICE.—P/O. N. H. Keel; F/O. R. H. Powell; L.A/C. L. Soper.

DIED ON ACTIVE SERVICE.—A/C.1 J. E. Brough;

A/C.2 W. Brumwell; L.A/C. A. V. Crouch; Cpl. M. F. Fortune; Sgt. W. H. Jump; A/C.1 F. Kilday; A/C.2 W. H. Litchfield; A/C.2 H. B. Morefield; Sgt. S. V. Simpson; Sgt. A. J. Stewart; L.A/C. J. Stott; L.A/C. T. J. Williams; W/O. L. G. Wood.

Women's Auxiliary Air Force

DIED ON ACTIVE SERVICE.—A/CW.2 J. W. Marshall.

Royal Australian Air Force

KILLED IN ACTION.—Sgt. K. A. Price; Sgt. J. C. Rudd.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Sgt. W. G. Blessing; Sgt. K. E. Dare; P/O. R. P. Godfrey; F/O. T. J. Forsyth; Sgt. J. D. Hancocks; Sgt. A. E. McCrae; Sgt. L. J. Sams; Sgt. W. G. Taylor; F/O. A. R. W. Webb; Sgt. A. F. Whittick.

WOUNDED OR INJURED IN ACTION.—Flt. Sgt. R. J. Raye.

MISSING, BELIEVED KILLED IN ACTION.—Sgt. F. B. Gillan; Flt. Sgt. J. M. Stone.

MISSING.—Flt. Sgt. R. D. Armour; Sgt. W. J. Clemow; Flt. Sgt. I. S. Gordon; P/O. N. R. Gyles; Flt. Sgt. J. S. Huggard; Sgt. A. E. Lewis; P/O. J. C. Parroissien; P/O. I. R. Robertson; Sgt. B. W. Thomas.

KILLED ON ACTIVE SERVICE.—Sgt. D. B. Griffiths.

Royal Canadian Air Force

KILLED IN ACTION.—Sgt M. D. Davis; Sgt. J. C. Leckie; F/O. J. W. Reynolds.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—P/O. S. O. Hill; Flt. Sgt. D. R. McKinnon.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Sgt. A. G. Amlon; Sgt. H. A. Clarson; Flt. Sgt. D. Conter; Sgt. H. C. Empey; Flt. Sgt. D. Fletcher; Flt. Sgt. E. Fortin; Sgt. W. C. Francoeur; P/O. W. A. Haliburton; Sgt. H. F. Hasleden; Flt. Sgt. C. H. Hincks; Act. Flt. Lt. G. P. Hughes; P/O. C. W. Keddy; P/O. W. J. Keough; Flt. Sgt. G. L. McKenna; Sgt. J. E. Meyer; Flt. Sgt. J. A. Ridley; Sgt. J. Paterson; P/O. L. N. Skinner; Sgt. D. MacN. Smith; Sgt. A. Swinderski; Sgt. R. N. Urquhart; Flt. Sgt. R. W. Veit; Sgt. R. W. Whytock; Flt. Sgt R. W. Woolner.

MISSING, BELIEVED KILLED IN ACTION.—Sgt. L. Debets; F/O. W. A. G. Hardy; F/O. A. E. Parsons.

MISSING.—Sgt. J. G. Alderson; Sgt. C. R. Baloer; Sgt. G. J. Banks; Sgt. G. A. D. Cameron; P/O. R. Cossette; Sgt. B. J. Deering; Sgt. W. G. Dent; Sgt. J. R. Grasley; W/O. R. W. Hudson; Flt. Sgt. A. L. Keith; P/O. R. D. Mix; Sgt. F. G. Moore; Flt. Sgt. W. E. E. B. Pridden; Sgt. T. D. Scarff; Sgt. N. A. Stelter; Flt. Sgt. R. N. Westman.

KILLED ON ACTIVE SERVICE.—Sgt. E. S. Blake.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED ON ACTIVE SERVICE, NOW PRESUMED KILLED ON ACTIVE SERVICE.—Act. Flt. Lt. J. F. Maguire.

WOUNDED OR INJURED ON ACTIVE SERVICE.—F/O. T. Sandberg.

Royal New Zealand Air Force

KILLED IN ACTION.—Sgt. J. R. Browning.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Sgt. A. F. Bissell; Sgt. V. A. B. Falk; P/O. M. J. H. Hunt; Sgt. L. A. Mitchell; Sgt. H. A. T. Watson.

MISSING.—Sgt. H. G. Corin; Sgt. V. C. Hewes; Flt. Sgt. J. D. D. Mackie; F/O. I. D. Prebble.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED ON ACTIVE SERVICE, NOW PRESUMED KILLED ON ACTIVE SERVICE.—P/O. T. A. Dixon.

South African Air Force

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—Lt. F. L. Stevens.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Flt. Sgt. R. L. Manley; Lt. I. Sedgwick; Lt. W. G. D. Wilson.

MISSING.—Lt. A. C. Futter.

DIED OF WOUNDS OR INJURIES RECEIVED IN ACTION.—2/Lt. R. C. Baker.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER OF WAR.—Lt. B. W. Young.

Casualty Communiqué No. 255

Of the names in this list 96 are second entries giving later information of casualties published in earlier lists.

Royal Air Force

KILLED IN ACTION.—Sgt. J. S. Andrews; Sgt. S. R. Mitchell; Sgt. B. A. R. Moore; Sgt. F. C. Verity; Sgt. J. Wykes.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—Sgt. F. W. Baker; Sgt. H. J. Balkwill; F/O. E. R. Butterworth; P/O. V. L. Currie; Sgt. G. W. Draper; P/O. C. J. Osmond; P/O. W. R. Simpson.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—F/O. R. E. Atkinson; Sgt. P. H. Bath; Sgt. W. Bennett; P/O. R. A. Bingham; Sgt. R. Bush; Sgt. A. E. W. Butler; Sgt. C. G. Calcutt; Sgt. A. Calvert; Act. Flt. Lt. R. D. W. Carrington; Sgt. J. C. Chambers; Sgt. W. Chester; Sgt. M. J. Clayton; Sgt. E. R. Cox; Sgt. D. M. Davis; Flt. Sgt. R. J. Deans; Flt. Sgt. F. K. Dennis; Sgt. G. McK. Duff; Sgt. K. J. P. Duncan; Sgt. P. H. Fairbanks; Wing Cdr. J. Fulton, D.S.O., D.F.C., A.F.C.; Sgt. M. P. Gallagher; Sgt. D. C. Garrity; Sgt. W. Gorman; Sgt. N. P. Gregson; P/O. E. W. Grundy; P/O. D. D. Gudmundsen; Sgt. J. Hutcheson; Act. Sgt. O. A. Hutchinson; Sqn. Ldr. G. C. Hyde; P/O. H. Johnson; Sgt. D. T. Jones; Flt. Sgt. S. F. Kane; Flt. Lt. D. N. Kennedy; Act. Sqn. Ldr. J. G. Kerry, D.F.C.; Sgt. F. Lister; Sgt. N. A. Long; Sgt. R. H. Lowe; Flt. Lt. E. F. W. McCartan-Mooney; Sgt. G. L. Marshall; Sgt. S. J. Oertel; Act. Flt. Sgt. W. T. Palmer; Sgt. P. R. Parsons; Sgt. J. Patch; Sgt. J. T. Pate; Flt. Sgt. B. C. Peters; Sgt. G. Phillips; Sgt. C. J. S. Poole; Sgt. J. M. Robertson; Sgt. W. H. Streater; P/O. W. C. Sutton; Sgt. A. E. Thomas; Sgt. C. E. Tipper; Sgt. S. W. Walliter;

Wing Cdr. Billy Drake, D.S.O., D.F.C. and Bar, who has now received the American D.F.C. for leadership and outstanding airmanship while operating with the Ninth Air Force.

Sgt. S. A. Webster; Sgt. W. R. Wells; Sgt. D. H. Whiting; Sgt. F. H. Wilson; P/O. N. D. Young.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW REPORTED KILLED IN ACTION.—L.A/C. D. V. Bullen.

WOUNDED OR INJURED IN ACTION.—Flt. Lt. E. R. M. Appleton; Sgt. K. T. Beavis; Sgt. W. H. Davine; Sgt. P. H. J. Harper; Sgt. B. R. Lilly-white.

DIED OF WOUNDS OR INJURIES RECEIVED IN ACTION.—Flt. Sgt. E. F. Bedell.

MISSING, BELIEVED KILLED IN ACTION.—Sgt. J. B. Browne; F/O. S. Coshall; Sgt. H. C. Ellis; Sgt. L. J. Ellis; P/O. W. H. Fisher; Sgt. R. A. Harvey; Sgt. R. L. Le Page; Sgt. G. H. Sparkes; Sgt. G. T. Tattam; Sgt. J. S. Yates.

MISSING.—Sgt. P. H. Alderton; Sgt. S. R. Atwill; Sgt. D. S. Barrett; Sgt. R. J. Barton; P/O. J. Baxter; Sgt. G. S. Bowles; Sgt. H. A. Briggs; Sgt. T. A. S. Buchanan; Flt. Sgt. A. Burn; Flt. Sgt. R. Butler; Sgt. D. C. Butlin; Sgt. J. L. Clark; Sgt. F. R. Cocks; Sgt. N. Cohen; Sgt. A. A. Collins; Sgt. A. Creswell; Flt. Sgt. R. J. Crossley; Sgt. S. J. Dackenfield; Flt. Sgt. P. B. Davies; Sgt. R. P. Dormer; Sgt. A. E. Down; Sgt. A. J. Dunn; Sgt. D. F. Gargrave; F/O. H. H. Gauntlett; Sgt. H. Gibson; Sgt. K. A. L. Giles; Sgt. E. L. Gummer; Sgt. D. W. Hagan; P/O. K. S. Hailey; Sgt. W. B. J. Happold; Flt. Sgt. F. S. Harrop; Sgt. J. A. Head; Sgt. K. J. Highsted; Sgt. G. M. Hill; Sgt. H. Hinett; P/O. S. M. Holliman; Sgt. J. Hunter; Flt. Sgt. H. C. Lamacraft; Act. Flt. Lt. A. G. Lang; D.F.C.; Sgt. C. H. Longley; Sgt. J. W. Lowe; Sgt. S. Lupton; Sgt. S. S. McClellan; Sgt. D. R. McGregor; Sgt. S. S. Marshall; Sgt. L. E. Mobley; P/O E. S. Opie; Sgt. J. W. Peacock; Sgt. W. J. Pelham; Act. Sqn. Ldr. E. G. Pett, D.F.C.; Sgt. N. A. Price; F/O. L. E. Richbell; Sgt. D. C. Robinson; Sgt. D. L. Rowland; Sgt. A. G. P. Sindrey; Sgt. R. E. Sloan; Sgt. T. H. Smith; Sgt. A. Stevens; Sgt. D. W. Suming; Sgt. A. G. Surtees; Sgt. J. Thomas; F/O. R. D. C. Thomas; Sgt. C. R. L. Thornton; Sgt. G. W. Trenery; Flt. Sgt. F. M. Venn; Sgt. C. D. Whitehall; Sgt. R. Williams; Sgt. E. F. Williamson; Sgt. D. R. Wilson; Sgt. G. R. Y. Wood; Sgt. N. H. Wood.

MISSING, BELIEVED KILLED ON ACTIVE SERVICE.—F/O. J. H. B. Eyles; Sgt. W. Greenwood; Sgt. L. F. Parratt.

KILLED ON ACTIVE SERVICE.—Sgt. T. A. Allen; P/O. R. K. Betchley; Sgt. G. F. Broadbent; Act. Sgt. R. W. T. Brock; Sgt. J. J. Brown; Sgt. A. H. Burn; Sgt. W. A. Cadel; Sgt. E. G. Cooper; Sgt. A. G. S. Corps; Sgt. L. F. Evans; P/O. A. R. Fox; Sgt. W. Greenhorn; Cpl. G. V. Jones; Sgt. F. J. Lauder; Sgt. H. Leather; Cpl. J. S. McKay; Sgt. H. Millward; Cpl. J. W. Moseley; Flt. Sgt. S. R. Mosey; Act. Flt. Lt. I. M. Munroe; Sgt. N. F. Owen; Flt. Sgt. S. A. Payne; Sgt. E. E. Russell; Sgt. J. Salad; Sgt. C. Scott; Sgt. J. W. Scott; Sgt. W. J. Shirley; Sgt. H. J. Spiers; Sgt. J. A. Ventham; Sgt. E. J. Washington; Sgt. W. R. Woods.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED ON ACTIVE SERVICE, NOW PRESUMED KILLED ON ACTIVE SERVICE.—Sgt. K. Bickmore, L.A/C. J. H. Shearn.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED ON ACTIVE SERVICE.—Sgt. V. G. Carter, P/O. K. B. Dyer.

WOUNDED OR INJURED ON ACTIVE SERVICE.—L.A/C. R. Brook; Flt. Lt. K. B. McGlashan; Flt. Sgt. R. G. Martin; L.A/C. H. A. Morgan; P/O. R. C. D. Vincent.

DIED OF WOUNDS OR INJURIES RECEIVED ON ACTIVE SERVICE.—P/O. G. H. Lawrenson.

DIED ON ACTIVE SERVICE.—A/C.1 T. F. Amies; Cpl. H. L. Cunliffe; Flt. Sgt. J. E. A. Huschmann; Cpl. W. J. D. Powell.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER OF WAR.—F/O. R. C. Hill.

Royal Australian Air Force

KILLED IN ACTION.—F/O. E. H. Brown, D.F.C.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Sgt. W. L. Staines.

MISSING.—Sgt. D. J. Shearman.

KILLED ON ACTIVE SERVICE.—P/O., W. T. McCormack, Sgt. H. E. Thorpe.

Royal Canadian Air Force

KILLED IN ACTION.—Flt. Sgt. J. J. Thompson.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—Flt. Sgt. C. H. Cobbett; Flt. Sgt. G. P. Fargher; P/O. J. F. Myrick.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—P/O. N. F. Durban; Sgt. J. S. Evans; Sgt. F. E. Johnson; Sgt. H. L. Laxdal; Sgt. P. C. Leslie; Flt. Sgt. J. W. Newman; Sgt. G. F. Smith; Sgt. R. A. Smith; Flt. Sgt. E. E. Warnwick; Flt. Sgt. G. A. Welsh; Sgt. E. G. White.

WOUNDED OR INJURED IN ACTION.—Sgt. R. C. Drake.

MISSING, BELIEVED KILLED IN ACTION.—F/O. E. G. Thornber.

MISSING.—Sgt. G. E. Armstrong; P/O. R. O. Blackhall; Sgt. K. E. Emmons; Sgt C. D. Heming; Flt. Sgt. W. R. Hewitt; Sgt. D. W. Johnson; Sgt. K. Kwasney; Flt. Sgt. R. J. Lee; Sgt. J. C. Lynass; Sgt. H. G. Machell; Sgt. J. T. Macksinchuk; Sgt. E. N. Moore; Sgt. J. Prosnyck; Sgt. W. J. Reid; P/O. W. A. Rollings; F/O. J. R. Sergeant; Sgt. H. P. Spencer; Sgt. A. J. Sutton; Sgt. H. F. Swan; Sgt. H. W. Toombs; Sgt. A. P. Uditsky; P/O. J. V. O. Wood.

KILLED ON ACTIVE SERVICE.—Sgt. C. R. S. Blenkhorn; Sgt. C. G. Bourne; Sgt. J. W. Freeman; Sgt. K. Hodgson; Sgt. A. W. Klauer; Sgt. E. H. Park.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED ON ACTIVE SERVICE, NOW PRESUMED KILLED ON ACTIVE SERVICE.—Sgt. G. K. Irwin; Sgt. A. W. Lufergey.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED ON ACTIVE SERVICE.—Flt. Sgt. D. F. Glinz; Flt. Sgt. W. R. Howard; Sgt. H. R. Williams.

Royal New Zealand Air Force

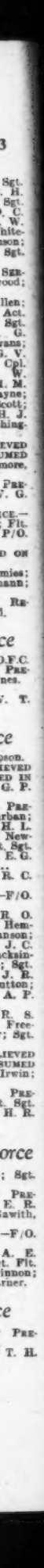
KILLED IN ACTION.—F/O. S. J. Clubb; Sgt. R. F. Harvey; F/O. J. Johnston.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Flt. Sgt. N. E. R. Carrel; P/O. J. Earle; Flt. Sgt. P. M. Gawith, D.F.M.; Sgt. F. S. Weaver.

MISSING, BELIEVED KILLED IN ACTION.—F/O. S. McGowan; Sgt. C. R. Smith.

MISSING.—P/O. T. J. Baynton; P/O. A. E. Coutts; Flt. Sgt. W. D. L. Goodfellow; Act. Flt. Lt. E. McE. Gray, D.F.C.; W/O. H. McKinnon; Flt. Sgt. D. G. Ridings; Sgt. T. W. J. Warner.

South African Air Force

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Lt. C. Evans.

KILLED ON ACTIVE SERVICE.—Lt. J. L. T. H. Brent; Lt. M. S. Ford.